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Capital Structure and Performance of Microfinance Institutions (MFIs)

- Cross Market Analysis -

자본 구조와 미소금융 기관의 성과

- 교차시장분석 -

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Abstract

Capital Structure and Performance of Microfinance Institutions (MFIs)

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Existing studies of capital structure and performance cover vast amounts of diverse firms including profit-oriented business and financial institutions based on the capital structure theories to describe how firms decide to finance their operation; however, studies related to the topic of microfinance institutions (MFIs) is fairly constrained as it only takes account of a specific region or country and previous research does not include the unique characteristics of MFI. As the purpose of MFIs is to contribute to poverty alleviation in developing and transition countries, their primary concerns are self-sustainability and outreach which are different from the conventional financial institutions, and they have started to engage in commercialization; this research would be conducted with some objectives. To begin with, it intends to give a short, understandable overview of MFIs to the readers; especially, potential investors. Then, it aims to investigate the casual relationship between the capital structure denoted by lagged debt to equity variable (lagDTE) and the performance of

507 MFIs from 44 countries for the period 2003-2015. Apart from other financial institutions, MFI performance is measured by either financial performance or outreach performance so this study would be employing return on equity (ROE) and operational self-sufficiency (OSS) measures as the proxies for financial performance measurement; while, the logarithm of number of active borrowers normalized by number of population (LNABP) and the logarithm of average loan per borrower divided by gross national income per capita (LALBGNI) would be used as a representative for the outreach performance measurement. Besides the main independent variable - lagDTE, there are other lagged controlling variables included such as gross loan portfolio to total assets (lagGLPTA), non-performing loans (portfolio at risk) past due for more than 90 days (lagPAR90), percentage of female borrowers (lagFB), MFI size (lagSIZE), MFI age (lagAGE), and three dummy variables: profit MFIs (Profit), regulated MFIs (Regulate), and deposit-taking MFIs (DT). With the use of the random effects and fixed effects panel data model, the empirical outcomes have been found to confirm the trade-off theory in corporate finance: that the financial leverage significantly and positively affects the profitability (ROE) and that the breadth of outreach of MFIs (LNABP) generated by the benefits of debt financing like tax shields, are consistent with the findings in previous literature. Furthermore, financial leverage could impose a financial distress on the management to perform better in order

to fulfill the payment obligations. In contrast, the operational self-sufficiency (OSS) and the depth of outreach (LALBGNI) are insignificantly affected by lagDTE. The insignificant inverse relationship between the financial leverage and operational self-sufficiency (OSS) could come from a number of MFIs which do not generate enough revenues to compensate for their operational costs. With further investigation, the findings of the effect of financial leverage on the performance of MFIs with different legal status are mainly insignificant. The main reason behind this is that MFIs have identical organizational models and objectives since the majority of shareholders are public funders. Correspondingly, MFIs could access the stable cost of available funding instruments from both private and public funders via microfinance investment vehicles (MIVs). For the final recommendations, all the related disciplines should therefore, weigh the advantages of debt against the costs before designing the sophisticated strategies, laws, and regulations to make financial inclusion because large amounts of debt are not always able to bring out the maximum benefits when it reaches a certain point based on the theory. Moreover, alternative sources of funding like deposits and innovative technology should be expanded as they assist in cost reduction and sustainable growth.

Keyword: Capital Structure, Financial Leverage, Operational Self-Sufficiency (OSS), Return on Equity (ROE), Breadth of Outreach (NAB), Depth of Outreach (ALB)

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I. Introduction

In corporate finance, capital structure is a vital topic of debate. Capital structure is defined as the financing decision that firms make to finance their operations and growth through debt or equity, or other outstanding securities (Berk J., DeMarzo P. & Harford J., 2012). Trade-off theory and pecking order theory are the competing models that explain how firms make decisions on financing in order to create the best mix of their capital structures. According to the pecking order theory, organizations would choose to use the internal funds before the external ones; whereas, trade-off theory states that firm would consider both benefits and costs of debt to reach their optimal level of leverage because of the asymmetric information problem. There are many empirical studies on the impact of financial structure on the performance of various firms including on big corporations, SMEs, and financial institutions that are based on these two theories. One study conducted by Foam and French (2002) has confirmed the pecking order theory: firms with larger profit have less leverage as managers prefer internal sources to the external ones. Conversely, topics that are related to this issue in microfinance institutions (MFIs) seem to be rather limited since existing studies have mostly focused on one specific country or economy (Ngoc N. B., 2016) and a number of literature reviews do not include the specific characteristics of MFIs. MFIs have played a necessary role in developing and transition countries because MFIs have

been providing financial services to the excluded groups left behind by the formal lending institutions in order to assist them in getting out of the grinding poverty; in particular, female borrowers since the late 1970s. Additionally, MFIs are different from other formal financial organizations as they have to reach both social mission and self-sustainability, which is called as the double bottom line (Hartarska V. & Nadolnyak D., 2007). By 2014, there were around 4,000 MFIs serving more than 200 million clients in developing countries (Fanconi P. & Scheurle P., 2017). Still, many poor borrowers have not yet received access to financial services. By 2013, there were 10.7 percent of the world population or 767 million people living below the poverty line a day – $1.90 (CGAP & Symbiotics' MIVs Surveys, 2016). Moreover, around 2 billion young people do not have a savings account and many micro-enterprises cannot access needed financial instruments (The World Bank, 2016). The challenge occurs because of the high transaction cost and the limitation in capital. Accordingly, there is many a huge development within MFI industry related to commercialization. The traditional MFIs like non-profit NGOs have also transformed themselves into profit commercial enterprises to find alternative funding sources (Armendariz B., & Morduch J., 2010).

Based on the unique characteristics of MFIs and their evolution, studying the impact of financial structure on the performance of MFIs would provide several implications based on the capital structure theory. Therefore, this research uses the

large unbalanced panel data and includes other specific characteristics of MFIs to shed light on the capital structure and the performance of MFIs which could fulfill the gap from the previous studies. This study also aims to provide a comprehensive background of MFIs to the outsiders; especially, to the potential investors. The last objective is to give any possible explanation between capital structure and the performance of MFIs.

As such, this research would answer three main questions: what is the impact of capital structure in terms of leverage on the performance of MFIs? How capital structure differently affects the performance of MFIs with different legal status? And what are the possible explanations of the outcomes?

This study is organized in six sections. Section II is literature review classified into three subsections: the brief and understandable explanation of institutional background, capital structure theories, and the evidence studies of the capital structure and firm performance including MFIs. Section III is empirical study divided into two subsections which consist of data and variables. Section IV presents the empirical models and methodology. Section V shows the empirical outcomes and discussion of the results in detail. Section VI provides some recommendations and limitations of this study and Section VII concludes the research.

II. Literature Review

One objective of this study intends to provide a short, comprehensive description of MFI background. As a result, this part would presently explain an overview of microfinance before proceeding to the theories of capital structure and the empirical evidences.

a. Microfinance Background

Microfinance could be defined as the financial service sources for the poor household who lacks to access to or does not have full access to the formal financial sector. Borrowers are able to get loans to establish or improve their business and to save money for the future needs through microfinance (Responsability, 2016). According to another definition, microfinance could also be described as the diversity of available financial services provided to the lower-income clients and underserved groups who have no or limited collateral and could not satisfy the required bank standard to take out loans. The purpose of microfinance is to fight against the poverty (Armendariz B., & Morduch J., 2010), empower women, and contribute to the sustainable economic development.

Why Microfinance Exists?

According to the economic theory, capital naturally flows from the rich to the poor or from the people who have a large amount of

capital to the people who is lack of it. Surprisingly, it is different from the traditional perspective as the big firms get loans more easily as compared to poorer borrowers even if they are able to provide high interest rates based on the diminishing return principle. The two problems: adverse selection and moral hazard encountering by the lenders may provide enough explanation why it is hard to lend to the poor. Related to the adverse selection problem, the lenders do not have complete information about the poor borrowers so that they are unable to distinguish between the safer and riskier clients. If so, they would need to charge the same interest rate from all the customers which would then cause the safer borrowers to leave the market. To overcome it, lenders need to gather the information of the clients, but it is costly and it incurs high transaction costs to provide small-sized loans comparing to the big ones. The moral hazard appears when the lenders are not sure whether or not the borrowers would make a full effort to succeed in their investment. Therefore, the lenders require sufficient marketable assets to safeguard their risk of default coming from the clients. However, the poor does not have the required marketable collateral which makes it impossible for them to get loans (Armendariz B., & Morduch J., 2010).

Although they are unable to access the formal markets, they have another option to borrow from the informal credit market such as from money lenders, friends, or neighbors. Those players know more about poor borrowers than banks do; however, as they are non-regulated operators, they have limited financial sources,

and charge ultra-high interest rates comparing to the formal financial institutions because they provide more flexible payment methods (Armendariz B., & Morduch J., 2010) & (Fanconi P. & Scheurle P., 2017) and are more accessible. As an example, the informal operators charge twice or triple higher interest rates than formal institutions in Cambodia (Kimsay H., 2015).

The presence of modern microfinance is the solution for both formal and informal lenders and it brings new hope to the poor. Microfinance does not only innovate the way to deal with risk through group lending but also brings more capital supply from both local and international investors to the poor borrowers (Armendariz B., & Morduch J., 2010).

Microfinance Development

The idea of micro financing is not new; it has been raised as a lending program focusing on the agricultural area since the early 1900s. If one thinks of the modern microfinance infrastructure in developing countries, its starting point was from Bangladesh, by Bangladeshi economist Muhammad Yunus in the middle of 1970s. He started to provide small-scale loans to the poor with no belongings, for them to establish small businesses that could give them the cash flow of income and tackle the sudden external shocks. In the mid-1980s, the Grameen Bank was established after he had found that the poor borrowers regularly paid their loans back although they had no collateral. Over the 1980s, microfinance spread widely to other continents. It has also begun

to improve its lending methodologies to benefit the poor and various types of MFIs have started to develop. From the 1990s onwards, MFIs have started to find additional ways of raising capital; for instance, many MFIs have entered into the capital market so that they could access more funding sources for the needs of the borrowers. Furthermore, they have taken the advantage of technology to cut down the transaction costs and to extend their products and services such as different kinds of loans, deposits, insurances and so forth (Sundaresan S., 2008) & (Fanconi P. & Scheurle P., 2017). In developing countries, there are around 4,000 MFIs serving more than 200 million clients in 2014 (Fanconi P. & Scheurle P., 2017). The countries where the global biggest microfinance markets are Cambodia, India, Kenya, Azerbaijan, Bolivia, Ghana, Mongolia, Paraguay, Tajikistan, Costa Rica, Peru, Kyrgyzstan, Armenia, Georgia, and Ecuador (Responsibility , 2016) (see Firgure 1).

Products and Services

In the last decade, MFIs merely provided loans to the underserved segmentation. However, nowadays the demands of product and service diversification are increasing. There are two main types of product and service of MFIs: financial services and non-financial services (Fanconi P. & Scheurle P., 2017).

Financial services consist of credit, saving, insurance, and transaction services (Fanconi P. & Scheurle P., 2017) & (Ledgerwood, 2013). Microloans provide borrowers with the

ability to take out loans of different sizes and terms in exchange for repayment contract at an agreeable requirement time with collateral substitutes [①] and alternative forms of collateral [②] (Ledgerwood, 2013). The credit product is provided in terms of individual loans and group loans. Individual loans are often provided to the individual borrowers with a small amount of collateral or guarantee to secure their risk; whereas, group loans are issued to the individual borrowers with a group. Each member agrees to joint liability or guarantee with other members. If one member does not repay the loan in a timely manner; there would be no further loans to others. Therefore, many MFIs do not demand collateral as each member would monitor other members by themselves. Each loan in terms of loan type, payment term, payment procedure, and loan interest is designed based on the customer need, income level, sector, and geographical area (Fanconi P. & Scheurle P., 2017) & (Earne J. & Sherk L., 2013). Moreover, loans are offered for different purposes such as cash flow management, risk management, asset building and productive investment (Ledgerwood, 2013).

Micro savings are regarded as the funding sources of MFIs which are collected from both individual – loan clients and non-loan clients –and institutions. Micro savings contain two main savings: compulsory or mandatory savings and voluntary savings.

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① Collateral substitutes: group guarantees, character-based lending, and frequent client visits (Ledgerwood, 2013).

② Alternative forms of collateral: compulsory savings and personal guarantees (Ledgerwood, 2013).

Compulsory or mandatory savings are the requiring conditional savings that the borrowers need to save as a fixed amount of loan if they want to receive a loan from MFIs and they act as the alternative forms of collateral. Voluntary savings refer to the savings by the public regardless of the loan clients. There are different kinds of voluntary savings with different features including interest rate and withdrawal ability that clients could choose based on different purposes. Different amounts of savings could help the poor to fulfill future expenses and deal with unexpected events (Ledgerwood J., 2013) & (Fanconi P. & Scheurle P., 2017). Micro savings would precisely describe in the funding sources section.

Micro insurance provides the borrower with protection against unexpected, potential shocks because the poor tend to encounter daily hazards such as illness, natural disasters, agricultural losses, and other dangers more often than others. The insurance products provided include life insurance, real estate insurance, health insurance, credit risk insurance, and some types of pensions designed according to the demands of clients. Some MFIs require insurance as the compulsory condition for granting loans (Fanconi P. & Scheurle P., 2017). In combination with other products and services, MFIs also provide transactional services such as local money transfer, remittance, mobile banking, and other kinds of payment as the demand for those is increasing (Fanconi P. & Scheurle P., 2017). The fee is charged differently across MFIs based on institutional policies and procedures.

Besides offering financial service, MFIs provide non-financial services. These services have both social intermediation and business development aim to profoundly improve needed skills of the target borrowers such as health education, literacy training, capacity building, agricultural knowledge, business networks, business training, and other kinds of services (Fanconi P. & Scheurle P., 2017) (see Figure 2).

Lending Methodologies

There are several lending methodologies of MFIs such as group lending, mutual monitoring, progressive lending, and regular meeting. Group lending is regarded as an effective way for modern MFIs to deal with asymmetric information as each member would agree to have joint liability, share knowledge, and to act as a monitor of payment for the other members. Thus, it reduces the loan default rate coming from through the use of peer pressure and social status. Mutual monitoring is the lending methodology through which borrowers share their own knowledge and experiences amongst other borrowers regardless of they are joint liability or non-joint liability; as a result, it could improve learning effect on other clients and would prevent potential repayment issues in the later stage. Progressive lending is another method that permits clients to get better loan conditions such as better interest rates and larger amounts of loans for the next disbursement if they make timely payments without any problem. The last one is the regular meetings with the loan officers of MFIs.

Loan officers could share necessary information of the organizational development, new products and services, and any updated policy or regulation with clients. They could also follow up on loan usage, get information on the difficulties and demands of the clients; in particular, they could identify potential issues so that they could prevent those problems from happening in advance (Fanconi P. & Scheurle P., 2017).

Types and Regulations

MFIs have different legal forms ranging from non-regulated institutions to regulated institutions with different characteristics. The following types of MFIs are institutions which are subject to international funding. NGOs could be divided into two kinds of institutions – NGOs which provide only loans and NGOs which supply financial services along with other kinds of non-financial services: economic and social services. NGOs are mostly funded by subsidies and donations and are under national laws: civilian and commercial law. NGOs are usually not subject to bank supervisory and non-regulated so that they are not deposit-taking institutions. Non-Bank Financial Institutions (NBFIs) are the kind of institutions that are transferred from former NGOs. NBFIs – including insurance companies, leasing companies, specialist credit companies, and others – provide limited financial services and non-financial services, but they mostly focus on group loans with no collateral. They are under certain state agency supervision so that they are permitted to take deposits until a

specific license is provided. Rural Banks or Rural and Community Banks are the type of MFIs that operate and target borrowers who work and live in the rural areas or borrowers who are involved in the agricultural field. Rural banks could be owned by government, member, and individual and normally function under the supervisory of a bank with license. A Credit Union or cooperative is defined as the member-based financial institution – known as financial cooperatives, cooperatives (SACCOs), savings and credits, credit unions, savings and loan associations, and building societies (Ledgerwood, 2013). Financial cooperatives could be formed based on the members who share a common religion, geographical location, or employment with varying sizes. The products and services are provided for the sake of member benefits with no outsiders and each member has a restriction on the number of holding shares. The generating revenue is paid as capital stock, dividend, interest rate reduction, and others. In addition, they are subjective to the laws of specific country. Specialized MFI banks are regulated institutions with strict legal framework and are monitored by the national central bank or other government institutions. MFI banks are subsidiary of other larger banks and independent institutions. Furthermore, they serve a larger range of clients from the lowest to the highest income-class of clients including the borrowers are not being reached by the formal institutions like bank (Fanconi P. & Scheurle P., 2017), (MIX, 2017) & (Ledgerwood J. , 2013).

Related to the regulation framework, there are two kinds of

MFIs: MFIs who do not mobilize deposits – called non-deposit-taking MFIs – and MFIs who are authorized to receive deposits – deposit-taking MFIs. As such, the deposit-taking MFIs are under to the strict laws and regulations from national bank of each country because they encounter higher risk which could cause a crisis within the whole financial system. The differences of regulation framework[③] between the non-deposit-taking MFIs and deposit-taking MFIs are capital adequacy ratio, minimum capital requirement, and liquidity ratio (see Table 1).

Challenges

There are some emerging challenges of MFIs such as cost to access credit, regulation, and multi-loans. The first challenge is that loan pricing in developing countries is higher than in the developed ones because the financial revenues of MFIs mainly come from small-sized loans with high transaction cost (see Figure 3). Operating costs consume more than half of the total amount of lending interest rate. Comparatively, operating costs could be varied depending on the different geographies in terms of higher financial system development and larger loan. The interest rates of loans are calculated based on their capital costs, operating costs, profits, contingency reserves, and tax

③ Regulation framework could be categorized into prudential and non-prudential regulation. Prudential regulation: the laws and regulations from banking and insurance supervision, and authorized, special supervisory bodies, is designed to protect depositors and country overall financial system. Non-prudential regulation contains the laws and regulations from consumer protecting agency, finance intelligent unit, and ministry of finance (Fanconi P. & Scheurle P., 2017).

expenditures (Fanconi P. & Scheurle P., 2017). The high loan price causes difficulties to both MFIs (limited transactions, product, and service innovation) and the clients; especially, the poorest (high interest rate of loans) (Sundaresan S., 2008). Additionally, it drives the mission drift[④] as lending of small loans to the poorer clients incurs high costs, reduces profitability, and lowers the chances of being sustainable so that MFIs would serve larger loans (Cull R., Demirguc-Kunt A. & Morduch J., 2007).

Another challenge is regulation framework. Only formal MFIs are regulated financial institutions while others - informal and semi-formal institutions - are not regulated which are disadvantages to the relevant parties such as borrowers, depositors, funders, and others, because only regulated MFIs are strictly monitored by regulators. Equally important, non-regulated MFIs have a limited ability to raise capital from potential investors; especially since MFIs are not allowed to mobilize savings. The cause could be explained by the incurring of transaction costs to comply with all the laws and regulations like the level of minimum capital balance at the central bank (Fanconi P. & Scheurle P., 2017).

Borrowing loans from multiple MFIs at the same time is another current problem. Clients take out loans from more than two or three institutions at once which makes them unable to pay

④ Mission drift: the diverse of traditional social mission of MFIs changing from targeting the neglected clients underserved by conventional financial institutions to wealthier borrowers in a profit-oriented manner (Fanconi P. & Scheurle P., 2017).

them back. This causes emerging problems for all involved institutions and causes over-indebtedness. The root causes of multiple lending include underused credit report, lack of a well credit assessment of potential clients, and the issuance of many land titles by legal authorities (which could be used as collateral documents many times) (Riecke, 2014).

Funding Sources

Funding plays a vital role in MFI industry to finance their transaction, to create new products and services, to support the growth of portfolio, and to penetrate new markets. MFIs have started to move from mainly depending on subsidies and donations to accessing other sources of funding like commercial banks in order to achieve their goals and support their potential future growths (Armendariz B., & Morduch J., 2010).

MFIs obtain funding sources ranging from individuals to institutions, from government to domestic commercial banks, and from small local NGOs to big international organizations in the form of donor grants, subsidies, and debt. There are also equity investors who consider investing in MFIs (Fehr D. & Hishigsuren G. , 2006).

If one takes a closer look at the balance sheet – total assets, total liabilities, and total capital – of MFIs, it would not be that different from the other profit-oriented business (see Table 2). As a consequence, there are two keys of capital sources for MFIs: liabilities financing and equity financing which could be regarded

as debt capital and equity capital. Choosing between debt and equity is arguable. However, cost and benefit strategy is usually used to define the optimal point across industry. To enumerate, external debt of MFIs has a significant relationship with tangible assets, profit distribution status, and size. Donations have significant relationship with past due loans and tangible assets meaning that donors consider about risk when they make the decision to give (Tchuigoua H., 2015).

The primary funding source of many MFIs has come from grants and highly subsidized loans – called 'soft loans' from either public funders or private funders such as multilateral agencies, aid agencies of government, foundations, NGOs, and other organizations with strict conditions and requirements of each agency (Fehr D. & Hishigsuren G., 2006). When MFIs have constant sales, strong collateral, and lucrative growth, debt financing would be taken into consideration in the case of lacking equity financing. In general, debt capital is preferred to equity capital because it has a lower cost of capital (Berk J.& DeMarzo P., 2007). There are advantages and drawbacks of debt financing.

The main benefits of debt are that the interest rate is tax deductible, therefore increasing the amount of income; control is maintained meaning that lender have no undue power on the firm, and there is profit retention as it puts the pressure to company to generate income in order to meet its interest payment obligation. The key costs of debt include the danger of property loss as the lenders require the borrowers to pledge collateral for security

when they default, the risk of bankruptcy causes by financial distress, and future cash flow and growth limitation (Berk J.& DeMarzo P., 2007) & (Way J., 2015). There are several types of debt financing in MFIs: voluntary deposits, compulsory or mandatory deposits, borrowing, and other liabilities.

Deposit products are one of the main funding sources of financial institution for lending operation (Fehr D. & Hishigsuren G. , 2006). Deposits are categories into voluntary deposits and compulsory or mandatory deposits. Both deposits have come from either individual (loan clients and non-loan clients) or other institutions (MIX Market, 2017).

Compulsory or mandatory deposits are amounts of money of credit that are required from MFIs as the collateral of lending loans. MFIs determine the amount of money to be saved, the term of deposits, and the time the borrowers have to deposit and could withdraw based on organizational deposit policy and procedure. Besides being as collateral, it also provides the funding source for the operation of MFIs. In contrast, it is an insufficient source for the lending activities of MFIs because it limits the number of clients served by MFIs. Thus, MFIs need to move to voluntary deposits for their long run operation (Wisniwski S., 1999).

Voluntary deposits are open to both non-loan clients and loan clients. There are many diverse saving products with different terms, interest rates, and withdrawal abilities such as current accounts, passbook saving accounts, contractual saving accounts, and time deposits (Ledgerwood J., 2013) & (Fanconi P. & Scheurle

P., 2017).

Current accounts – called checking accounts or demand accounts– are deposits that clients could make their daily transactions anytime without prior notification. MFIs usually require clients to deposit some amounts of money as a minimum balance with no interest payment to depositors as it has high cost and risk. The fee of current accounts is charged monthly, transaction basic or both of them based on MFI policies and procedures. Besides providing funding for lending operations, it is also a tool for attracting clients to MFIs. Passbook saving accounts are deposits that clients could fully make daily transaction or in some restrictions and these transactions would be recorded in the passbooks. It is easily accessible and clients could receive some amounts of interest rate. Moreover, it provides the stable funds to MFIs and attracts micro-clients. Contractual saving accounts including commitment savings or target savings are the deposits that clients need to regularly deposit some amounts of money within particular time for specific purpose (Ledgerwood J., 2013). Time deposits – fixed deposits, term deposits, certificates of deposits – are deposits that do not allow daily transactions to be made. Clients are not able to withdraw them until they reach a specific term such as 3 months, 6 months, 9 months, or 12 months with different interest rates depending on the term of time deposits. Time deposits provide huge amount of funds to MFIs with a longer term of funding sources and low administrative costs (Wisniwski S., 1999) & (Ledgerwood J., 2013).

Both voluntary deposits and compulsory or mandatory deposits provide large amounts of low-cost funding sources to MFIs to be self-sustainable without heavily relying on donations or subsidies which are not stable and restricted to the operation of MFIs. By 2014, deposits are account for 50% of funding sources of MFIs (Perron, 2016). Additionally, many deposit-taking MFIs which enable diversity of voluntary saving products to fulfill client needs could serve small depositors and reach both breadth and depth of outreach (Gonzalez A. & Meyer R., 2009) & (Wisniwski S., 1999).

Borrowings and other liabilities are defined as the credits or amounts of money which MFIs borrow from either local or international financial institutions, from public funders or private funders in terms of short term or long term debt at the market interest rate like commercial loans or lower than market interest rate including grants or soft loans (concessional borrowing) based on the objectives (social, return, or both focus), mandates, and conditions of investors (Perron, 2016) through fund administrators [⑤] – microfinance investment vehicles (MIVs). Credit funding from commercial banks at market interest rate is expensive comparing to grants, donors, or subsidies for small size

[⑤] Fund administrators are financial intermediaries between public investors/private investors and MFIs. They are professional institutions that select, invest, advice, and follow up MFIs. The top ten managers of MIVs are: BlueOrchard Finance, Cyrano, Developing World Markets, Finance in Motion, Incofin, Oikocredit, ResponsAbility, Symbiotics, Triodos, and Triple Jump – which are account for 74% of total global microfinance portfolio (Fanconi P. & Scheurle P., 2017).

MFIs or new established MFIs, but it provides the huge amounts of funding sources for MFIs which are restricted to mobilize deposits or have capital limitation (SapundzhievaRalitsa, 2011), (Wisniwski S., 1999), (BoganVicki, November 2012) & (Fanconi P. & Scheurle P., 2017).

Besides raising capital through debt, MFIs could be financed from equity. Equity financing is an act of raising funds from either the owners of institution, public funders, or private funders to reach the demand of liquidity within MFIs. MFIs could issue stocks in terms of common stock or preferred stock without borrowing from creditors (Perron, 2016). Shareholder equity is calculated by total assets minus total liabilities meaning that owner equity is the residual interest after all assets are sold and all liabilities are paid (Delloite,2010)&(Clark K., 2015). Therefore, negative shareholder equity could occur once the total liabilities are greater than total assets. There are different advantages of equity financing. Equity funds provide substantial funding sources to MFIs. There is no financial distress of interest rate repayment although institutions get loss as it is a form of ownership that the investors share their risk together. Firm could use equity to generate cash flow for expanding growth and to pay all cost. For a young organization with no credit record, equity financing is important to cover the start-up costs (Wisniwski S., 1999). In contrast, equity financing also has drawbacks. The control of firm or ownership would be shared amongst the other investors and the profits given to investors could be larger than the amount of interest rate firm pay

for borrowing (Berk J.& DeMarzo P., 2007). Similarly, if the majority of owners mainly consider the financial return in the form of dividend, MFIs would bear high cost of capital requiring by risk premium and could not get benefit from tax-deduction (Wisniwski S., 1999).

To sum up, MFIs could rise funding from three main sources: debt, equity, and deposits (if the MFIs have authority to collect deposits) from both private and public funders[⑥] at local and international location through MIVs. The MFI funding sources obtained throughout the MIVs are classified by type of funders and funding tools (see Table 3). The main player of funding MFIs is from public funders and the main source of funding is a deposit which is cost less as compared to the rest, following by debt capital and equity capital. Furthermore, the local financing dominates the international financing caused from the cost of raising capital (Fanconi P. & Scheurle P., 2017) (see Firgure4).

Consequently, each type of MFIs has own specific ownership and funding instruments (see Table 4). Each source of funding has both pros and cons; therefore, MFIs have to consider what the optimal capital structure is in order to reach their double bottom line: social mission and self-sustainability mission. The decision of financing firm could be explained by the theories of capital structure in corporate finance.

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⑥ There are two types of funders: public funders and private funders. Public funders aim to reach development goals, social goals, and private factor involvement. Private funders intend to meet both profit and social objectives (Earne J. & Sherk L., 2013).

b. Theories of Capital Structure

Capital structure is a composite of debt capital and equity capital. Related to this issue, there are two most competing theories such as trade-off theory and pecking order theory which attempt to describe the financing behaviors and the effect of capital structure on the performance of firms in corporate finance (Fama F. E. & French R. K, 2002) & (Swinnen S., Voordeckers W. & Vandemaele S., 2005).

Both theories have developed from the traditional capital structure theory of Modigliani and Miller (MM). In perfect market, it is stated that the capital structure has no relevant to the value of the firm regardless of the usage of debt or equity meaning that there is no optimal leverage ratio based on the assumptions of MM irrelevant propositions. MM theory assumes that there are no tax benefits, no costs of transaction, no costs of bankruptcy, equal information access of investors, and same interest rate of each funding source. MM theory with taxes is stated that the more of debt, the more value of firm because the firm could be beneficial from the tax deduction (Modigliani F. & Miller M. H., 1958) & (Modigliani F. & Miller M. H., 1963). In the reality, the market is imperfect; there are costs of bankruptcy, costs of agency, and tax shields so that the capital structure is relevant to the value of firms as well as their performance.

Trade-off theory is the theory that firms identify their best mix of financial structure – the portion of debt and equity – by

weighting either costs or benefits of one more dollar of debt within imperfect market. The costs of debts consist of costs of bankruptcy, costs of agency, and other costs. Whereas, the advantages of debts could be free cash flow creation, interest rate gained by tax deductibility, and other pros that have already mentioned. The consideration between costs and benefits of debts is varied across profitable firms and growth firms (Fama F. E. & French R. K, 2002). To illustrate, firms with profitability would choose debt rather than equity since the firms could get benefit from tax deductibility (Myers S. C., 1984). For firms with more investment opportunities would have lower leverage because they do not have free cash flow problems (Fama F. E. & French R. K, 2002).

In contrast, pecking order theory developed by Myers in 1984 states that firms choose retained earnings (internal sources), then external sources – debt (from the safe one to the risky one) before equity because of the costs of financing. The financing costs include costs of issuing new securities and asymmetric information costs because insiders have better information than outsiders leading to the mispricing of the market value of the firm (Myers S. C., 1984). Therefore, the difference level of leverage of the firm is not from the consideration between cost and benefit of the debt, but by the net cash flows of the firm. The theory predicts the profitable firms have lower leverage because debt increase does not assist their operation while the amount of profit is greater than investment needs. Additionally, the firms with investment

opportunities have higher leverage because firms could get higher amount debt with lower-cost. Conversely, the firms with higher expected investment have lower current leverage as firms consider both future and current costs of financing (Fama F. E. & French R. K, 2002) & (Black K. H., 2002).

Within the perfect market, firms could take advantage of using debt comparing to equity. However, the high level of leverage up to a specific point would cause the firm financial distress and end up with bankruptcy because firms have to fulfill interest rate payment obligation. As a result, when firm increased the level of debt, the weighted average cost of capital (WACC) would decrease at the first period, after that it would be increased. The optimal capital structure could be different by industry (industry with more fixed assets and industry with more intangible assets) and life cycle of business (newly firms tend to use equity rather than debt to cover their initial costs) (Ross S., 2015).

c. Studies of Capital Structure and Performance

There are empirical evidences from the existing studies related to the capital structure and the performance of firms, financial institutions, and MFIs.

Related to the findings of the capital structure and the performance of firm supporting the pecking order theory, one study done by Fama and Frenh (2002), which tested the predications of trade-off and pecking order theory from 3,000

firms using more than thirty years' worth of data with statistical model improvement, finds that the larger profitable firms has lower amount of leverage because manager prefers internal financing to external capital complying with pecking order theory. Hossain and Nguyen (2016) studying Canadian oil and gas companies finds the same results between strong negative correlation between financial leverage and the performance of companies before, during, and after the financial crisis. Tong and Green (2005) paper shows both trade-off and pecking order theory using listed companies in China to describe how firms make decisions related to the funding their operations based on three models developed from the previous papers by Baskin (1985, 1989) studied USA, Allen (1993) focused on Australia, and Adedeji (1998) studied Britain. The research notes that there is a significant negative correlation between leverage and profitability of the firms because firms tend to choose the lower-cost sources – retained earing – among available financing choices. Another important explanation is the information asymmetry which causes the limitations on the capital financing (Baskin J., 2007).

For the empirical evidences supporting the trade-off theory, Leary and Roberts (2005) using regulated and financial firms covering from 1984 to 2001 data describes the larger profitable firms are more likely to choose debt over equity because they have less default risk so that they could borrower at the lower interest rate. The results are similar to Hovakimian, Hovakimian, and Tehranian (2004) studies corporations with equity issues and

dual credit. Helwege and Liang (1996) emphasizes the IPO firms using data of security offerings of the IPO firms from 1984 to 1992 presents that it is unrelated to the deficit in internal sources when firms consider to raise external funds. Moreover, the finding is opposite to pecking order theory when the firms decide to choose different kinds of security offering in capital markets.

Related to the capital structure and the performance of financial institutions, Taani (2013) demonstrates the effect of capital structure on the performance of bank in Jordan from 2007 to 2011. The results of this research using multiple regressions are mixed such as there is a negative significant relationship between majorities banking performance: net profit, return on capital, net interest margin, debt to equity, and debt to total funds except for return of equity. The research illustrates that Jordanian banks rely on long-term debt rather than equity financing and the reason behind the negative relationship is the higher cost of debt with some recommendations. The findings were consistent with the pecking order theory. In contrast, Hutchison and Cox (2006) studies the causality between profitability and bank capital of US taking both period of less regulation and high regulation. The study finds the positive relationship between financial leverage and the profitability of US banks measured by the return on equity (ROE) and the return on asset (ROA). The results tend to support the trade-off theory: firms with profitability would choose debt rather than equity related to the costs of available financing sources (Myers S. C., 1984). Similarly, Skopljak (2012)

researching on the authorized deposit-taking institutions in Australia, notes the increase in the level of leverage could lead to the increase in profit efficiency of the institutions and the performance as a consequence. The reasons are the higher level of debt causes institutions more financial distress and this pressure makes management to perform better.

The studies are relevant to the financial leverage and the performance of MFIs done by Kyereboah-Coleman (2007). The research investigates the impact of financial structure on the performance of MFIs in Ghana using 10 years of panel data. It employs the outreach and default rate as the performance indicators. The empirical results emphasize the positive relationship between leverage and performance meaning that higher amounts of debt assisted MFIs could reach out to more clients (outreach) which in turn, would let the MFIs increase income and profitability through economics of scale in operating cost reduction and product diversification. Thus, MFIs with higher level of leverage perform better. Equally, Abar and Javaid (2016) describe the relationship between capital structure and the profitability of MFIs using data from 2004 to 2010. The outcomes of the positive significant correlation between debt to equity (DTE) and the performance of MFIs of both studies are similar to the other papers done by Sekabira (2013) investigates the role of capital structure on the performance of MFIs in Uganda and by Omare (2017) tests the impact of financial structure on the performance of deposit-taking MFIs in Kenya. From the empirical

evidence, it could be concluded that highly leveraged MFIs perform better because of earning effect and the well- financial management of MFIs.

Contrastingly, Ngo (2016) aims to test the effect of capital structure and legal status on the financial sustainability of MFIs in 17 developing countries using data from 2010 to 2014. The result presents the financial structure measured by debt to equity (DTE) has a significantly negative impact on the operational self-sufficiency (OSS) because of the associated cost of debts and the neglect of financing cost assessment (CGAP, 2007). Moreover, the research shows that there was no big difference in financial sustainability among different legal status of MFIs because theses MFIs have similar goals and business practice for serving the clients (Hartarska V., 2005) & (Mersland R. & Strom R. O., 2008) and most of funding are come from the public funders (Kohn D., 2013).

The finding related to legal status of Ngo (2016) is opposite to Tchakoute-Tchuigoua (2010) researched on the performance comparison of MFIs regarding to their legal status covering the period from 2001 to 2006. The finding is that there is significant difference among the different types of MFIs because various ownerships might shape different organizational structures leading to the different results. Importantly, private MFIs have better performance in operational self-sufficiency (OSS) than non-government organizations (NGOs) and profit MFIs have better social performance than non-profit MFIs. Another paper

conducted by Vanroose and D'Espallier (2013) tests the relationship between the financial sector development including different types of MFIs and the performance of MFIs. The findings prove that MFIs could serve more borrowers and earn more profit in less-developed financial system because MFIs could fulfill the gap that commercial banks could not do based on the hypothesis of market failure.

III. Data and Variables

a. Data

This research intends to understand the causal relationship between the capital structure in terms of financial leverage and MFIs performance: financial sustainability and outreach with additional control and firm characteristic variables. This study uses the unbalanced panel data from Microfinance Information Exchange (MIX[⑦]) Market covers 507 MFIs from 44 countries over the period of 2003 to 2015 in six regions such as Africa, East Asia and the Pacific, Eastern Europe and Central Asia, Latin America and the Caribbean, Middle East and North Africa, and South Asia. MIX Market is a non-profit-institution that intends to promote information exchange among the MFIs worldwide. Data from MIX Market is widely used and is considered as a reliable source of

⑦ MIX Market could access through domain: http://www.themix.org/mixmarket. Some publications and performance indicators could freely access using MIX Discovery. To broadly get more data and information of each MFI, there are three more packages to subscribe based on the key data and indicators, accessibility, and price: MIX Essentials, MIX Intelligence, and MIX Gold.

cross-country data containing both financial statements and outreach information of MFIs in US dollar using prevailing exchange rate. There are also many previous studies using the data of MIX Market so that the source of data is recognized as accountable (Ngoc N. B., 2016), (Quayes S., 2012) & (Vanroose A. & D'Espaller B., 2013). Furthermore, the country dataset of total population is exported from the website of World Bank.

However, not all the data exporting from the MIX Market is used in this research. The sample only the country that has at least three MFIs and each MFI must have three consecutive years or more as the minimum requirement, has been chosen. The observations with below 0.5% and above 99.5% are removed because it is related to the outlier problem. Blank, abnormal data, and some years with small number of observations are also dropped. Initially, the total amount of data is 1606 MFIs of 108 countries over the period of 1999 to 2016, but the observations are dropped if they do not qualify the minimum criteria. The data contains different characteristics and types of MFIs such as regulated and non-regulated MFIs, credit union/cooperative, bank, non-government organization (NGO), non-bank financial institution (NBFI), rural bank, other, and profit and non-profit MFIs.

b. Variables

Dependent Variables

MFIs are different from other formal financial institutions as they

have to reach both social mission and self-sustainability called as the double-bottom line (Hartarska V. & Nadolnyak D., 2007). On one hand, MFIs need to reach out the underserved segmentation that live in the rural area and are not able to access to the formal institutions with their innovative market-based approach. On the other hand, MFIs need to operate by themselves without depending on subsidies or donations through income generation to cover the transaction cost. Therefore, the measurement of the performance of MFIs is quite different from other formal financial institutions with two important indicators. These measurements could provide some basic insights into the performance of MFIs in the minimum level to the outside investors (Rosenberg R., 2009).

Financial Performance Measurement

If MFIs intend to maintain and enlarge their operations in the long run, they need to earn enough returns to cover their operating costs (Rosenberg R., 2009). Thus, return on equity (ROE) is a common indicator widely used in financial institutions. ROE is the profitability or sustainability ratio measuring the ability of MFIs in generating incomes through the investment of owners (Rosenberg R., 2009). Its formula is net operating income minus taxes and divides by the average equity. Net operating income is calculated as the financial revenue minus the sum of financial expense, loan-loss provision or impairment loss, and operating expense (MIX, 2017). Average equity is the sum of total equity at the beginning year and the total equity at the end of year divided by 2. Average

equity is used because it gives an accurate description of the performance of MFIs during the fiscal year when there is any considerable change in equity value of shareholders (Harvey R. C., 2012).

This measure is suitable for institutions which do not get subsidies or donations. However, there are MFIs which obtain donations or subsidies in the form of grants or soft loans (concessionary loans) with an interest rate that is lower than the market rate. Therefore, it is important to measure the ability of MFIs operate by themselves. To identify it, there must be 'adjusted' in financial report (Rosenberg R., 2009) & (Armendariz B., & Morduch J., 2010).

The subsidy-adjusted measurement is operational self-sufficiency (OSS) and it could be used to analyze financial sustainability of MFIs (BoganVicki, November 2012). It indicates the extent to which the financial revenues of MFIs cover their adjusted costs. OSS is calculated as the total financial revenue divides by the sum of financial expense, loan-loss provision or impairment loss, and operating expense (Armendariz B., & Morduch J., 2010). Financial revenues of MFIs mostly come from the interest rates and fees by loan clients; in contrast, a typical institution also receives revenues from investments and other financial services such as insurance, remittance, and other services (Armendariz B., & Morduch J., 2010). Financial expense are the interest rates and fees that MFIs pay to shareholders, commercial banks, and other investors including depositors (if

MFIs are allowed to take deposits by regulators) (Armendariz B., & Morduch J., 2010). Loan-loss provision or impairment loss is the amount of non-cash expense calculated as the expected percentage of the value of loan portfolio could not be recovered (Armendariz B., & Morduch J., 2010) & (MIX, 2017). The rate of loan-loss provision or impairment loss is calculated based on the loan classification and the number of overdue days in laws and regulations on financial institutions of each country. To take an example, loan classifications in Cambodia are categorized in four classes such as standard, substandard, doubtful, and loss (NBC, 2002). Operating expenses are expenses on rent fees, depreciation and amortizations, personnel costs, administrative costs, and other operating costs. This ratio is presented as the percentage. MFIs with OSS more than 100 percent could operate by themselves without depending on additional subsides or donations (Armendariz B., & Morduch J., 2010) & (Rosenberg R., 2009).

Outreach Performance Measurement

Besides reaching financial sustainability as one bottom line, MFIs also aim to meet social mission (outreach). Outreach is defined as reaching out to the poor clients and is calculated by the number of the poor borrowers being served at a given point in time (Rosenberg R., 2009). There are two important kinds of outreach indicators. The first measurement is the breadth of outreach considered as the number of clients being served and the second

one is the depth of outreach taking account of how the poor clients being served (Rosenberg R., 2009).

The breadth of outreach is calculated as the number of active borrowers (NAB). It is more beneficial than the cumulative number of loan portfolio or clients reached during one period to reflect the actual service transaction of MFIs (Rosenberg R., 2009). The number of active borrowers is divided by number of population to normalize for the variation in population as data from many different countries.

Another measurement is depth of outreach measurement of borrower poverty level. The depth of outreach is denoted by average loan balance per borrower (ALB): Gross loan portfolio divides by the number of active borrowers. This ratio also measures the loan size disbursed by MFIs. The smaller this ratio, the smaller loan size being served, the better depth of outreach MFIs has been reached (Quayes S., 2012). This indicator is often expressed as a percentage of gross national income (GNI) per capita to compare MFIs from different countries with different national incomes (Rosenberg R., 2009).

There is a debatable point on the advantages of both types of outreach. The depth of outreach is more beneficial to the non-profit MFIs while MFIs consider more on the self-sustainability would rather access to the breadth of outreach (Rhyne E., 1998). However, some support the idea that reaching out the wide range of borrowers could be compensated for serving the poorest (Armendariz B., & Morduch J., 2010) & (Robinson M. S., 2001).

Thus, the dependent variables proxies as the MFIs performance measurement are financial performance measurement (return on equity (ROE) and operational self-sufficiency (OSS)) and outreach performance measurement (the logarithm of the number of active borrowers/number of population (LNABP) and the logarithm of the average loan per borrower/gross national income per capita (LALBGNI)).

Independent Variables

The standard indicator of capital structure, lagged debt to equity (lagDTE) calculated as the total liabilities divided by total equity, is used as an explanatory variable which describes the extent to which MFIs depend on debt funding. Besides lagDTE ratio, there are also other lagged control variables and MFI specific variables that could influence the performance of MFIs.

Gross loan portfolio to total assets (lagGLPTA) ratio is a lending measurement of MFIs. This ratio also shows the ability of MFIs about borrower acknowledgement and lending administration. The higher ratio is, the higher risk exposure MFIs encounter. In contrast, the transaction costs of MFIs are high because MFIs use market-based approach; this ratio is supposed to be a positive relationship with financial performance (Abrar A. & Javaid Y A., 2016), but it is uncertain with outreach performance.

Non-performing loans (Portfolio at risk) with overdue 90 days (lagPAR90) is calculated as the total amount of loan portfolios overdue 90 days in arrears divides by the gross loan portfolio. It

is used to measure risk of MFIs. It indicates the loan collection ability and general management ability of MFIs. It is meant that the more number of delinquencies is, the more risk exposure is. LagPAR90 affects the profitability of MFIs so that it is expected to be negative relationship with financial performance (Abrar A. & Javaid Y A., 2016); however, it is unclear with outreach.

More than 60 percentages of borrowers are female borrowers in sample of this observation as MFIs do not only aim to reduce poverty but also empower woman. Therefore, percentage of female borrowers (lagFB) would also control. In previous literature, it has been proven that the increase in woman borrowers positively affects the performance of MFIs because women make regular repayments and have less risk of default. Thus, this variable is expected to have positive correlation on the financial performance and outreach performance (Hermes N. & Lensink R., 2011) & (Quayes S., 2012).

MFI Size (lagSIZE) is considered to affect the performance. Different sizes of MFIs have differences in opportunities of investment, market segmentation, technology, and product diversification. Big MFIs have low costs of operation based on the benefits of economics of scale and scope, debt financing accessibility, commercialization, more resources, and bigger market (Yang C. & Chen K., 2009). Regarding to the advantages of size, this variable is calculated as the logarithm of total assets and it is expected to have a positive effect on the financial performance (Kipesha F. E., 2013), but it could be positive or

negative relationship with outreach performance.

Number of operating years of MFIs (lagAGE) could affect their performance because older MFIs have more learning experiences about their operations which could be more cost efficiency, have more knowledge about existing market so that the risk of default is lesser, have more financial and non-financial resources comparing to the start-up MFIs based on the concept of selection effects, learning by doing effects, and inertia effects (Kipesha F. E., 2013). LagAGE is expected to have positive relationship with financial performance and the breadth of outreach, but have negative relationship with the depth of outreach.

Besides, this study also controls for other MFI specific characteristics variables as the dummy variables. There are three dummy variables in this research: regulated MFIs (Regulate), profit MFIs (Profit), and deposit-taking institutions (DT). Regulated MFIs show the ability to get commercial sources, mobilize deposits from both loan and non-loan clients, and be subjective to the strict regulation and supervision framework to benefit to the poor. Regulate variable is expected to be positive correlation with the outreach performance, but it is unclear with financial performance (Abrar A. & Javaid Y A., 2016). Profit status of MFIs expresses the ability to create income and divides the profit to the relevant parties: owners, shareholders, personnel, and MFI themselves while non-profit MFIs consider more on outreach. As a result, MFIs with profit status are considered to have better financial performance while non-profit MFIs have

better outreach (Quayes S., 2012). As deposit is one of MFI financing and MFIs with more deposit collection could reduce the cost of funding, deposit-taking institutions dummy variable is controlled. Deposit-taking MFIs are considered to have positive relationship with performances (see Table 5).

IV. Empirical Models and Methodology

The empirical model with all previous explained variables is used to measure financial sustainability and outreach of MFIs:

Financial Performance Measurement

$$ROE_{it} = \alpha_0 + \beta_1 \text{lagDTE}_{it} + \beta_2 \text{lagGLPTA}_{it} + \beta_3 \text{lagPAR90}_{it} + \beta_4 \text{lagFB}_{it} + \beta_5 \text{lagSIZE}_{it} + \beta_6 \text{lagAGE}_{it} + \beta_7 \text{Regulate}_{it} + \beta_8 \text{Profit}_{it} + \beta_9 \text{DT}_{it} + \mu_{it} \quad (1)$$

$$OSS_{it} = \alpha_0 + \beta_1 \text{lagDTE}_{it} + \beta_2 \text{lagGLPTA}_{it} + \beta_3 \text{lagPAR90}_{it} + \beta_4 \text{lagFB}_{it} + \beta_5 \text{lagSIZE}_{it} + \beta_6 \text{lagAGE}_{it} + \beta_7 \text{Regulate}_{it} + \beta_8 \text{Profit}_{it} + \beta_9 \text{DT}_{it} + \mu_{it} \quad (2)$$

Outreach Performance Measurement

$$LNABP_{it} = \alpha_0 + \beta_1 \text{lagDTE}_{it} + \beta_2 \text{lagGLPTA}_{it} + \beta_3 \text{lagPAR90}_{it} + \beta_4 \text{lagFB}_{it} + \beta_5 \text{lagAGE}_{it} + \beta_6 \text{Regulate}_{it} + \beta_7 \text{Profit}_{it} + \beta_8 \text{DT}_{it} + \mu_{it} \quad (3)$$

$$LALBGNI_{it} = \alpha_0 + \beta_1 \text{lagDTE}_{it} + \beta_2 \text{lagGLPTA}_{it} + \beta_3 \text{lagPAR90}_{it} + \beta_4 \text{lagFB}_{it} + \beta_5 \text{lagSIZE}_{it} + \beta_6 \text{lagAGE}_{it} + \beta_7 \text{Regulate}_{it} + \beta_8 \text{Profit}_{it} + \beta_9 \text{DT}_{it} + \mu_{it} \quad (4)$$

The detail interpretations and the formulas of all the dependent and independent variables could be found in Table 5; α

represents for constants; β is a coefficient of variable; i denotes individual MFIs; t stands for time, and μ is the error term. The model 3, MFI size (lagSIZE) is deleted because it is involved with the multicollinearity problem based on the correlated matrix which would be described in the following section. The study runs descriptive statistics to deal with outlier problem and uses correlated matrix to tackle with multicollinearity issue.

As this research uses unbalanced panel data containing different time periods and countries, the hypotheses testing related to the time-fixed effect and country-fixed effect is separately done with Breusch-Pagan Lagrange multiplier (LM) test (Torres-Reyna O., 2007). The results illustrate that time and country are significant for this study; therefore, dummy variables of time and country are included when running the model. This study also uses lagged independent variables to see the causality between independent and dependent variables.

Besides, this research uses both random effects and fixed effects panel data model[⑧]. Fixed effects model is used to cut down the effects of specific time invariant influences like managerial efficiency and other factors across MFIs that cause the different results. Whereas, the random effects model assumes there is no any omitted variable or there is no correlated between omitted variables and independent variables. If that is a case, random effects model would provide unbiased coefficients (Quayes S.,

⑧ The detailed explanation of random and fixed effects model could be found in Econometric Analysis of Panel Data by Baltagi H. B. (2005)

2012). Additionally, dummy variables could only be captured by random effects model.

V. Empirical Results and Discussion

Table 6 presents the descriptive statistics summary of all dependent and independent variables from the period of 2003 to 2015 with matched number of observations. The minimum value of OSS was 0.32 (32%) and the maximum 2.69 (269%) with mean value was 1.17 (117%). It means that the average number of MFIs could cover their expenses by financial revenues as MFIs are considered to reach their sustainability, operate by themselves without additional subsidies, if OSS is at least equal to 100% or 1. However, this outcome also shows there are some MFIs could not earn enough revenues to compensate their costs resulting in negative equity until they obtain subsidies or soft loans from outsiders. The mean value of ROE is 0.12 (12%) with high standard deviation, negative minimum value -3.67 (-367%), and maximum value 2.87 (287%) points to insufficient generating profit to cover costs. For number of active borrowers (NAB), average loan balance per borrower (ALB), and MFIs lending (GLPTA), the standard deviation is highly distributed within MFIs. The mean value of DTE is 4.95 (495%) which is greater than 100% or 1 meaning that MFIs across 44 countries are leveraged. The table also presents there is numbers of microfinance institutions have negative equity because total liabilities are bigger than total assets.

The average rate of default (PAR90) is about 4% and around the average number of female borrowers (FB) is more than 60% which is meant that most of MFIs lend to female clients. The data contains different sizes of MFIs in total asset (LSIZE) and the average numbers of MFIs are matured as the average age of their operation is around 12 years (AGE).

Table 7 is the correlation matrix summary. The results show the Pearson correlation coefficients among variables from 2003 to 2015. The value that is close to 1 or -1 means both variables are highly correlated in the same or the inverse relationship. The highly related variables would not be used together in the model to avoid overlapped measurement. The bivariate relationship between LNABP and LSIZE is high. It could be explained that larger MFIs have more clients. Thus, model 3 would exclude LSIZE. The overall models of this study could be used without the problem of multicollinearity.

a. Empirical Results

Table 8 presents the results of two models – random effects model and fixed effects model– between the financial leverage and the financial performance measurement of MFIs. The first row illustrates that 1% increase in lagDTE results in around 0.01% increase in ROE for both random and fixed effects model, the estimated coefficient is significant at the 0.1% level. The significant positive correlation between lagDTE and profitability confirms the previous study findings done by Abar and Javaid

(2016), Sckabiral (2013), Omare (2017), and Kyereboah-Colemn (2007). In contrast, lagDTE has negatively impact on OSS in random effects panel data model; it is positive in fixed effects panel model even if both of them are statistically insignificant. MFI lending (lagGLPTA) is highly and positively correlated with financial performance at the 0.1% significant level. It is meant that increasing 1% of lending could raise 0.29% of ROE in both models; the OSS in either model also shows increase. As expected, the higher risk exposure lowers profitability, gives less chance to cover the operating costs, and MFIs are unable to operate by themselves. LagFB is positive insignificant with both ROE and OSS for fixed effects and random effects model. MFI size (lagSIZE) and MFI age (lagAGE) show positive relationship with ROE and OSS although the impact is different in significant levels. It confirms the previous studies that larger firms and older firms are advantageous to resource management, cost management, and other above-mentioned benefits. Regulated MFIs, profit MFIs, and deposit-taking MFIs are insignificant correlation with either OSS or ROE for random effects model.

Table 9 is the results of financial leverage and outreach performance measurement. LagDTE is significant positive relationship with the breadth of outreach (LNABP), although it is insignificant with the depth of outreach (LALBGNI) in both random effects and fixed effects panel data model. Thus, 1% increases in financial leverage results in about 0.01% increase in the breadth of outreach with the 0.1% and 1% significant level of the estimated

coefficient respectively. The empirical results are consistent with the previous literatures conducted by Kyereboah-Colemn (2007). lagGLPTA affects positively and significantly on the breadth of outreach while it is insignificant inverse relationship with the depth of outreach in both random effects and fixed effects model. LagPAR90 impacts negatively on both outreach indicators. It points that MFIs with the higher rate of default would find the difficulties to serve more clients as it causes low earning revenues. The higher percentage of female borrowers (lagFB) is the more clients MFIs reach since it has statically significant positive relationship with the breadth of outreach. As the previous studies found, MFIs intend to empower women and women have better repayment rate. Unexpectedly, it has an inverse correlation with the depth of outreach in 0.1% and 1% significant level for both models. These findings could be explained that MFIs are less efficient when lending to female clients (Hermes N., Lensink R. & Meesters A., 2011). MFI size (lagSIZE) has significant positive related with the depth of outreach. It could be interpreted that the bigger MFIs is, the richer in resources to serve the poorest are. MFI age (lagAGE) has significant positive correlation with the breadth of outreach, but it has negative relationship with the depth of outreach. The negative effect is because the poorest could benefit from lending regardless of the age of the MFIs. Regulated MFIs, profit MFIs, and deposit-taking MFIs have positive impact on the outreach performance to some extent. As a result, MFIs with these specific characteristics could reach out more clientele

due to the restrict supervision from the regulators.

b. Empirical Results of MFIs with Different Legal Status

With diverse legal status of MFIs in dataset, this study would do further analysis by separately running the random effects model. By doing so, it would provide the clearer picture of the impact of capital structure on the performance of different types of MFIs: Non-government organization (NGO), Non-bank financial institutions (NBFI), Bank, Credit union/ Cooperative (CU/COO), and Rural bank (RB). These MFIs are different to legal framework, products, services, and above-mentioned points.

Table 10 shows the causal relationship between financial leverage and ROE of MFIs with different legal status. LagDTE of NGO and NBFI are highly significant positive relationships with ROE at 0.1% significant level of the estimated coefficient. Rising 1% in lagDTE cause 0.01% and 0.02% upturns in ROE of NGO and NBFI. It could be caused by the available lower-cost funding sources and the high amount of lending that MFIs could earn premium while others are insignificant. ROE of all types of MFIs are negatively affected by lagPAR90 with significant level except for bank. Again, the higher default rate is, the lower earning income of MFIs is. MFI age (lagAGE) of bank is positive and significant, so it could be concluded that the older bank is, the higher profit they could obtain as it could take advantage of the reasonable interest rate of commercial loan. Profit CU/COO and RB have positive correlation with the profit performance at 1% and

5% significant level, while the others are insignificant. The percentage of female borrowers (lagFB), MFI size, regulated MFIs, and deposit-taking MFIs are insignificant across MFIs meaning that the ROE performance is not influenced by these variables.

Table 11 illustrates the impact of lagDTE on operational self-sufficiency (OSS) of MFIs with different legal status. The outcome shows the financial leverage negatively affects the OSS of bank although the others have negative insignificant correlations excluding credit union/cooperative (CU/COO). CU/COO may access lower cost of funding sources from their members. Whereas, bank is significantly affected by the debt financing at 1% significant level because banks are regulated institutions which are under the strict laws and regulations. Moreover, they tend to depend on more debt financing than donations or subsidies (Boga V., 2009). As a result, they might not generate enough income to cover the interest rate repayment of debts as well as it is costly to comply with legal requirements. MFI lending (lagGLPTA) is positive correlation across many MFIs, but only NGO and NBFI are significantly positive with OSS. LagPAR90 is negative relationship with OSS; only NGO and CU/COO are significant. Only bank is statically affected by the lagFB at 1% significant level. The outcomes confirm larger and older MFIs gain more advantages comparing to the smaller ones. Regulated MFIs, profit MFIs, and deposit-taking MFIs are insignificant with OSS.

Table 12 presents the financial leverage and the breadth of outreach performance (LNABP) of MFIs with different legal

statues. NGO, NBFI, and bank are positively and significantly affected by lagDTE at the 5% significant level of the estimated coefficient. 1% increases in lagDTE raises 0.005%, 0.007%, and 0.008% of LNABP of NGO, NBFI, and bank respectively. But, CU/COO and RB are insignificant. MFI lending (lagGLPTA) has significant positive correlation with the breadth of outreach of NBFI, bank, and RB while others are positive insignificant. The default rate (lagPAR90) affects negatively on the LNABP of all kind of MFIs, but not significant excluding bank (at 0.1% significant level) and CU/COO (at 5% significant level). There is the positive and significant impact of lagFB and the breadth of outreach for MFIs except for CU/COO as it is the member-based financial institution. MFI age (lagAGE) positively influences the LNABP of majority of MFIs. However, RB is affected in the inverse relationship and Bank is insignificant. Besides, regulated MFIs, profit MFIs, and deposit-taking MFIs are insignificant correlations with LNABP for all MFIs excluding profit RB which is significantly positive with LNABP at 1% significant level.

Table 13 notes the effect of financial structure on the depth of outreach (LALBGNI) of MFIs with different legal status. The financial leverage is positive and significant correlation with the depth of outreach of RB at the 1% significant level while the others are insignificant. All types of MFIs have negative relationship with lagFB; especially, NGO, NBFI, and bank at 0.1% significant level. Meanwhile, CU/COO and RB are affected by lagFB at 5% significant level. It could be caused by the inefficiency of lending

to female clients. The outcomes of lagGLPTA, lagPAR90, regulated MFIs, profit MFIs and deposit-taking MFIs are mixed, but they are mostly insignificant related with LALBGNI. All MFI size (lagSIZE) is positive correlated with LALBGNI; in particular, NGO, NBFI, bank, and CU/COO at 0.1% significant level. Contrasting with MFI size, MFI age (lagAGE) has negative correlation with LALBGNI of NBFI except for RB which is positive and significant.

c. Discussion

The crucial outcome based on the empirical study is the essential role of capital structure in terms of financial leverage on the performance of MFIs: profitability (ROE) and the breadth of outreach (LNABP) as shown in Table 8 and Table 9. Accordingly, the impact of capital structure is insignificant with operational self-sufficient (OSS) and the depth of outreach (LALBGNI). The positive and significant effects of capital structure come from the advantages of debt financing like tax shield which confirm the trade-off theory and are consistent with the previous studies done by Abar and Javaid (2016), Sckabiral (2013), Omare (2017), and Kyereboah-Colemn (2007). The advantages of debt help MFIs to generate income and pay their transaction costs such as financial expense, loan loss provision, and operating expense. When MFIs could earn sufficient financial revenue to cover their cost, they are able to operate by themselves without heavily depending on the subsidies or soft loans and they also could reach more clients.

Once MFIs serve more customers, they could obtain more interest rates and fees as their incomes. However, the result of OSS is negative insignificant correlation with debt. It may come from some MFIs could not generate enough profit to cover their expenditures. Moreover, the higher amount of debt does not always bring out the benefits. When it reaches to the certain level, the costs of debt would outweigh the advantage ones so that there is an optimal leverage (see Figure 4).

Based on the trade-off theory stated that the optimal point of debt is when the marginal return of debt is equal to the marginal cost of debt (Berk J., DeMarzo P. & Harford J., 2012). It meant that firms could benefit from borrowings when the present value (PV) of tax shield coming from interest rate is greater than the financial distress created by direct costs of bankruptcy and indirect costs of financial distress. If the firm goes on borrowings at the point beyond the optimal level, firm would fall into the risk of bankruptcy. This theory is also applicable to MFIs even if MFIs have double bottom line. As a consequence, it is very important to consider the sources of financing – whether financing through debt or equity– to create the best mix of capital structure within own firm and the different usages of leverage are different across industries as elucidated by the theory.

Additional to the trade-off theory, the high level of debt could put pressure on managers of MFIs to take appropriate actions to prevent the risk of default caused by financial distress depended on the agency theory. Consequently, it reduces the agency cost

and makes MFIs earn more profit, be self-sustainable, and serve more customers. The reduction of agency cost was confirmed by Skoplijak (2012) and Kyereboah-Colemn (2007) papers.

Besides studying the impact of capital structure as a whole, this research also aims to specifically investigate how MFIs with different legal status are affected by debt financing. The results are mixed as the majority of MFI types have insignificant impacts in the same direction and some are affected by the financial leverage in various significant levels. The findings could be explained that the business model and goals are greatly similar across MFIs with different legal status (Ngo (2016), Hartarska (2005), and Mersland and Strom (2008)), the stable funding costs across MFIs (CGAP & Symbiotics' MIVs Surveys, 2016), and the majority of shareholders in MFIs are public funders (Kohn (2013), MicroRate (2013), and Earne and Sherk (2013)) so that most of the MFIs affect in the same direction of correlation.

VI. Recommendations and Limitations

a. Recommendations

Based on these empirical results, managers, funders, investors, and governments should fully comprehend both costs and benefits of debt financing as it is two-fold financial instrument before setting appropriate strategies, laws, and regulations to make the financial inclusion. Equally important, cheaper cost of funding sources like deposit and innovative technology should be taken

into consideration since they help MFIs to boost efficiency through effective management, to generate more income, to cut down cost, and to broadly serve the underserved segmentations.

b. Limitations

There are some limitations to this study. Firstly, it is related to the data source. Even if the MIX Market contained many MFIs from different countries, all of the worldwide MFIs are not obligated to report their financial statements or financial information to this organization. As a consequence, the number of MFIs is constrained which may have affected the results as a selection bias. Secondly, some important variables such as types of funders, types of products and services, lending methodologies, and others could not be obtained to be put in the model and analysis as the control variables that led to the endogeneity problem, the issue when the independent variables are correlated with the unobservable variables or error term, could have contributed to the biased results. By the same token, the research does not take into account the reverse causality that performance drives the capital structure of MFIs rather than capital structure drives the performance (Skopljak V., 2012). Moreover, this study does not include a robustness check as there is no big change of the results. The last but not least, the period of this study covers the period from 2003 to 2015, including the period of global financial crisis. Therefore, this may have also affected the outcomes of empirical

results.

VII. Conclusion

Capital structure is a topic of debate within corporate finance. There are two competing theories that describe the behavior of financing decision across firms with existing empirical studies. In contrast, the study of this problem is quite limited within microfinance industry because the previous studies have mainly focus on one region or one economy and the numbers of studies have excluded the other firm characteristics that could affect the performance of MFIs. Therefore, this study was intended to fulfill the gap to the existing literatures. According to the main empirical results, the profitability and the breadth of outreach of MFIs are positively and significantly affected by the financial leverage. The pros of debt financing assist MFIs to increase financial revenues, to cover their operation costs, to be independent of subsidies, and to reach out the poor and the poorest (Abar and Javaid (2016), Sckabiral (2013), Omare (2017), and Kyereboah-Colemn (2007)). As there are different types of MFIs regarding of their legal status, this research separately ran the random effects model to see how financial leverage individually influences the performance of MFIs. The finding is that debt financing has insignificant correlation with most types of MFIs and few MFIs are slightly affected in the same direction. The similarity of organizational models and objectives, stable funding costs, and majority of public shareholders across

MFIs could have contributed to the outcomes (Ngo (2016), Hartarska (2005), and Mersland and Strom (2008), (CGAP & Symbiotics' MIVs Surveys, 2016), Kohn (2013), (Earne J. & Sherk L., 2013), and MicroRate (2013)). As a consequence, all the relevant practitioners or parties should be fully aware of the side effect of debt financing to make financial inclusion; more importantly, cost efficiency should be considered through other funding sources and technology innovation.

References

Abrar A. & Javaid Y A. (2016). The Impact of Captial Structure on the Profitability of Microfinance Institutions. South Asian Journal of Management Sciences, 21-37.

Armendariz B., & Morduch J. (2010). The Economics of Microfinance. Cambridge, Massachusette, London, England: MIT Press.

Baltagi H. B. (2005). Econometric Analysis of Panel Data. England: John Wiley & Sons, Ltd.

Baskin J. (2007). An Empirical Investigation of the Pecking Order Hypothesis. Financial Management Association International, 26-35.

Becker P.M. (2010). Investing in Microfinance: Integrating New Asset Classes into an Asset Allocation Framework Applying Scenario Methodology. Wiesbaden: Gabler Research.

Berk J.& DeMarzo P. (2007). Corporate Finance. New York: Pearson.

Black K. H. (2002). Testing Trade-Off and Pecking Order Predications about Dividends and Debt (Digest Summary). CFA Digest.

CGAP. (2007). MFI Capital Structure Decision Making: A Call for Greater Awareness.

CGAP, M. G. (2017). Microfinance FAQS. Retrieved from CGAP: Consultative to Assist the Poor, Microfinance GATEWAY: https://www.microfinancegateway.org/what-is-microfinance

CMA. (2014). Microfinance Environment. Retrieved from Cambodia Microfinance Association : https://www.cma-network.org/en/microfinance-in-cambodia

Coleman K. (2007). The Impact of Capital Structure on the Performance of Microfinance Institutions. The Journal of Risk Finance, 8, 56-71.

Delloite. (2010). iGAAP 2010 Financial Instruments: IAS 32, IAS 39, IFRS 7 and IFRS 9 Explained. Butterworths: LexisNexis.

Earne J. & Sherk L. (2013). Funding. In J. Ledgerwood, The New Microfinance Handbook: A Financial Market System Perspective (p. 379). Washington DC: The World Bank.

Fama F. E. & French R. K. (2002). Testing Trade-Off and Pecking Order Predictions about Dividends and Debt. The Reveiw of Financial Studies, 15, 1-33.

Fanconi P. & Scheurle P. (2017). Small Money - Big Impact: Fighting Poverty with Microfinance. West Sussex: Wiley.

Fehr D. & Hishigsuren G. . (2006). Raising Capital for Microfinance: Sources of Funding and Opportunities for Equity Financing. Journal of Development Entrepreneurship, pp. 133-143.

Gonzalez A. & Meyer R. (2009). Microfinance and Small Deposit Mobilizations: Fact and Fiction? MIX: Microfinance Information Exchange.

Hartarska V. & Nadolnyak D. (2007). Do Regulated Microfinance Institutions Achieve Better Sustainability and Outreach? Applied Economics , 39, 1207-1222.

Hartarska V. (2005). Governance and Performance of Microfinance Institution in Central & Eastern Europe and the Newly Independent State. World Development, 33: 1627-1648.

Helwege J. & Liang N. (1996). Is There a Pecking Order? Evidence from a Panel of IPO Firms. Journal of Financial Economics , 40, 429-458.

Hermes N. & Lensink R. (2011). Microfinance: Its Impact, Outreach, and Sustainability. World Development, 39, 875-881.

Hermes N., Lensink R. & Meesters A. (2011). Outreach and Efficiency of Microfinance Institutions. World Development, 39, 928-948.

Hossain T. A. & Nguyen X. D. (2016). Capital Structure, Firm Performance and the Recent Fianncial Crisis. Journal of Accounting and Finance.

Hutchison D. E. & Cox R. K. (2006). The Causal Relationship Between Bank Captial and Profitability. Westwood Development Group and University of Ontario Institute of Technology, Annuals of Financial Economics, Working Paper Series.

Kimsay H. (2015, February 04). Unlicensed Lenders Called Out. Retrieved from The Phnom Penh Post: http://www.phnompenhpost.com/unlicensed-lenders-called-out

Kohn D. (2013). Microfinance 3.0: Reconciling Sustainability with Social Outreach and Responsible Delivery. Heidelberg: Springer Berlin Heidelberg.

Kyereboah-Coleman A. (2007). The Impact of Captial Structure on the Performance of Microfinance Institutions. The Journal of Risk Finance, Vol 8, 56-71.

Leary M. T. & Robertst M. R. (2005). Do Firms Rebalance Their Capital Structures? Journal of Finance, 2575-2619.

Ledgerwood J. (2013). Saving Services. In Ledgerwood J., The New Microfinance Handbook (pp. 199-211). Washington: The World Bank.

Ledgerwood, J. (2013). Institutional Providers. In Ledgerwood J., The New Microfinance Handbook: A Financial Market System Perspective (pp. 171-195). Washington: The World Bank.

Ledgerwood, J. (2013). The New Microfinance Handbook: A FInancial Market System Perspective. Washington DC: The World Bank.

Mersland R. & Strom R. O. (2008). Performance and Trade-Offs in Microfinance Organisations: Does Ownership Matter? Journal of International Development, 20, 598-612.

MicroRate. (2013). The Sate of Microfinance Investment 2013: Survey and Analysis of MIVs - 8th Edition. Retrieved from http://www.microrate.com/media/downloads/2013/11/MicroRate-The-State-of-Microfinance-Investment-2013.pdf

MIX Market. (2017, 02 01). Mix Publications: MFIs Trends and Benchmarks. Retrieved from MIX Market: www.themix.org/publications/search/results/taxonomy%3A16

MIX, M. I. (2017, May). Glossary. Retrieved from MIX: https://www.themix.org/resource/glossary/glossary

Modigliani F. & Miller M. H. (1958). The Cost of Capital, Corporate Finance and the Theory of Investment. American Economic Review, 48, 261-297.

Myers S. C. (1984). The Capital Structure Puzzle. Journal of Finance, 39, 575-592.

NBC. (2002). Prakas on Loan Classification and Provisioning Applicable to Specialized Banks for Rural Credit and Licensed Microfinance Institutions. Phnom Penh, Cambodia: National Bank of Cambodia.

Ngoc N. B. (2016). The Effect of Capital Structure and Legal Status on Financial Sustainability of MFIs in developing countries. Review of Business & Economics Studies.

Omare S. O. (2017). Effect of Capital Structure on Performance of Microfinance Institutions: A Case of Deposit Taking Microfinance Institutions. Interantional Journal of Entrepreneurship Business Management , 1-15.

Perron, J.-L. (2016). Sustainable Development Goals: What are the Stakes for Microfinance? Microfinance Barometer 2016.

Quayes S. (2012). Depth of Outreach and Financial Sustainability of Microfinance Institutions. Applied Economics, 44, 3421-3433.

Responsability. (2016). Mirofinance Market Outlook: Developments, Forecasts, Trends. Responsability.

Rhyne E. (1998). The Yin and Yang of MIcrofinance: Reaching the Poor and Sustainability. Vol 2, 6-9: MicroBanking Bulletin.

Robinson M. S. (2001). The Microfinance Revolution: Sustainable Finance for the Poor. Washington, D.C.: World Bank.

Rosenberg, R. (2009). Measuring Results of Microfinance Institutions: Minimum Indicators That Donors and Investors Should Track. Washington: Technical Guide, CGAP: Consultative to Assist the Poor.

Ross S. (2015, March 19). What is Capital Structure Theory? Retrieved from Investopedia:http://www.investopedia.com/ask/answers/031915/what-capital-structure-theory.asp

Sapundzhieva R. (2011). Funding Microfinance - a Focus on Debt Financing. MIX Market, MicroBanking Bulletin.

Sekabira H. (2013). Capital Structure and Its Role on Performance of Microfinance Institutions: The Ugandan Case. Substainable Agriculture Research .

Skopljak V. (2012). Capital Structure and Firm Performance in the Financial Sector: Evidence from Australia. Asian Journal of Finance & Accounting , 4, 278-297.

Sundaresan S. (2008). The Changing Landscape of Microfinance. In Sundaresan S., Microfinance: Emerging Trends and Challenges (pp. 1-24). Massachusetts, USA: Edward Elgar .

Swinnen S., Voordeckers W. & Vandemaele S. (2005). Capital Structure in SMEs: Pecking Order Versus Static Trade-Off, Bounded Rationalty and the Behavioural Principle. European Financial Management Association, 1-40.

Taani K. (2013). Capital Structure Effects on Banking Performance: A Case Study of Jordan. International Journal of Economics, Finance and Management Sciences, 227-233.

Tchakoute-Tchuigoua H. (2010). Is There a Difference in Performance by the Legal Status of Microfinance Instiutions? The Quarterly Review of Economics and Finance, 50, 436-442.

Tchuigoua, H. T. (2015). Capital Structure of Microfinance Institutions. Journal of Financial Service Research, pp. 313-340.

The World Bank. (2016). World Development Indicators 2016: Featuring the Sbustainable Development Goals. . Washington: The World Bank.

Tong G. & Green C. J. (2005). Pecking Order or Trade-Off Hypothesis? Evidence on the Capital Structure of Chinese Companies. Applied Economics, 37, 2179-2189.

Torres-Reyna O. (2007, December 2007). Panel Data Analysis Fixed and Random Effects using Stata (v.4.2). Retrieved from https://www.princeton.edu/~otorres/Panel101.pdf

Vanroose A. & D' Espallier B. (2013). Do Microfinance Institutions Accomplish Their Mission? Evidence form the Relationship Betweenn Traditional Financial Sector Development and Microfinance Institutions' Outreach and Performance. Applied Economics, 45, 1965-1982.

Vanroose A. & D'Espaller B. (2013). Do Microfinance Institutions Accomplish Their Mission? Evidence form the Relationship Between Traditional Financial Sector Development and Microfinance Institutions' Outreach and Performance. Applied Economics, 45, 1965-1982.

Way J. (2015, Mar 20). The Advantages of Using Debt as Capital Structure. Retrieved from Chron: http://smallbusiness.chron.com/advantages-using-debt-capital-structure-22011.html

Wisniwski S. (1999). Microsavings Compared to Other Soruces of Funds. CGAP: Consultative Group to Assit the Poorest, Working Group on Saving Mobilization.

Yang C. & Chen K. (2009). Are Small Firms Less Efficient? Small Business Economics, 32, 375-395.

Zhang Q. (2017, June 29). How Microlending Could End Extreme Poverty. Retrieved from World Economic Forum: https:// www. weforum. org/ agenda/2017/06/how-microlending-could-end-extreme-poverty? utm_content=buffer0e03a&utm_medium=social&utm_source=facebook.com&utm_campaign= buffer

Figure 1 Development of Main Microfinance Markets

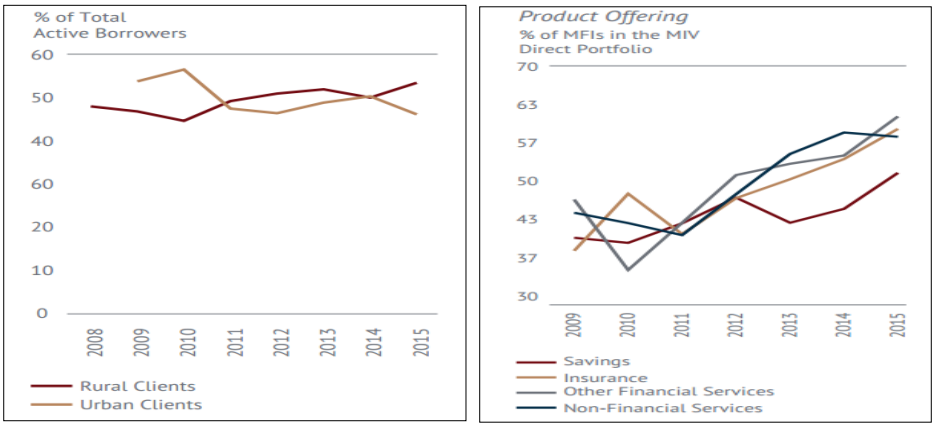
This figure shows the development and trends of main microfinance markets by region in 2016. Global microfinance market was supposed to grow from 10-15% in 2016. Sub-Saharan Africa and Asia Pacific were expected to have the strongest prospects among other regions.

Region	Percentage
Central Asia and Caucasus	0-10%
Latin America	5-10%
Eastern Europe	10%
Middle East and North Africa	10-15%
Sub-Saharan Africa	15-20%
Asia Pacific	Around 30%

Source: (Responsability, 2016)

Figure 2 Percentages of Active Borrowers and Product Offering

Figure 2 shows the percentage of number of active borrowers and product offering by the MFIs via MIVs from 2008 to 2015. The number of voluntary savings is an upward trend so that it is expected to proceed with regulatory mechanisms from regulators.



Source: (CGAP & Symbiotics' MIVs Surveys, 2016)

Table 1 Characteristic of MFIs

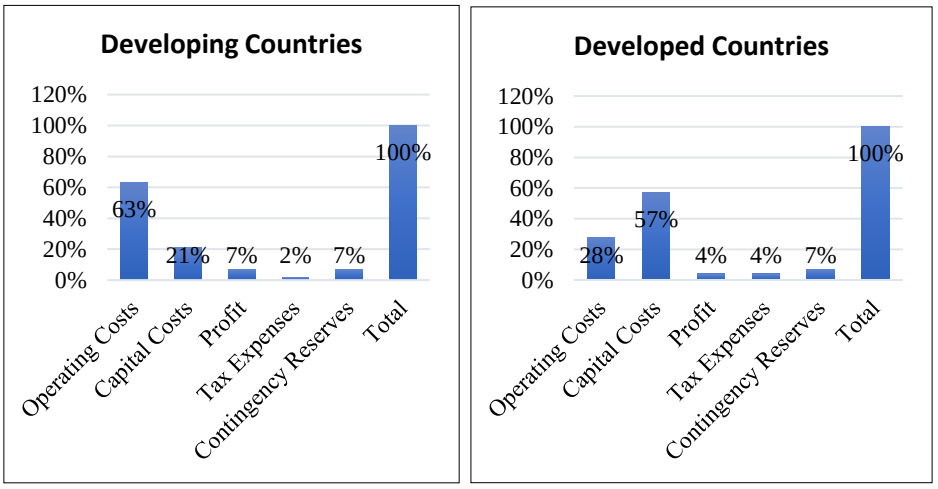
Table 1 presents the distinctive unique characteristics of MFIs with different legal status in terms of legal form, regulation and oversight, client type, and products.

Type of MFIs	Legal Form	Regulation and Oversight	Client Type	Products
NGOs	Registered as an NGO, not-for-profit institution, or company limited by guarantee	Not regulated, may be subject to government oversight	Poor, "unbanked" clients	Traditionally credit led
NBFIs (Non-bank Financial Institutions)	Licensed as an NBFI or modified financial institution by each country's framework	Regulated by central bank or specialized body or by one or more government units	Variety of clients depending on products' types	Range from credit only, leasing, insurance, usually unable to mobilize deposits
Rural Banks	Licensed as a bank	Regulated by central bank or specialized body or by one or more government units	Generally rural clients or agricultural clients	Primarily savings, wide distribution network leveraged for payment services
Credit Union/ Cooperative	Registered with central authority	Credit Unions may be regulated, oversight by specialized body	Variety of clients, based on members	Basic savings and credit, led by savings within members
MFI Banks	Licensed as a bank or other form as per regulatory requirements	Regulated and supervised by central bank, ministry, or a specialized body	Unserved or underserved individuals or micro or small businesses	Credit, savings, insurance, payment services, terms depended on clients' needs

Source: (Ledgerwood J. , Institutional Providers, 2013)

Figure 3 Determinants of Interest Rates

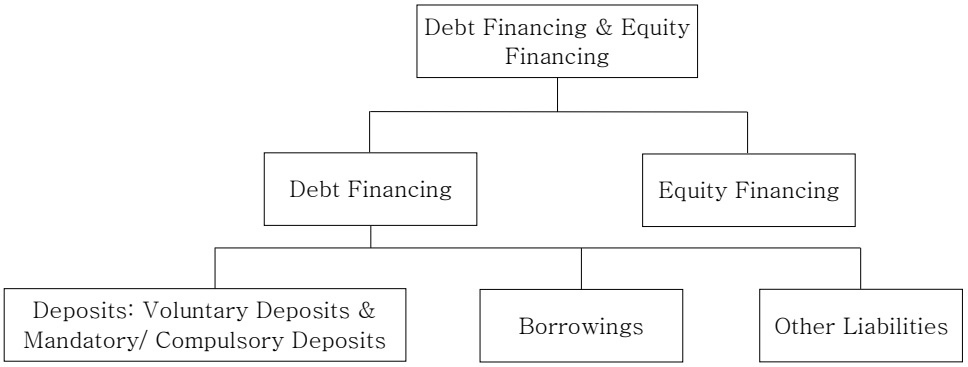
Figure 3 is the comparison of operation costs in lending between the developed countries and the developing countries based on the data from Germany. Operating costs account for 63% of total amount of interest rate in developing economies; whereas, it is less than 30% in developed economies.



Source: (Fanconi P. & Scheurle P., 2017)

Table 2 Financial Structure of MFIs

Table 2 illustrates the funding sources of MFIs. MFIs could raise capital in the form of debt or equity or both from private funders and public funders. Debt capital includes deposits, borrowings, and other liabilities.



Adapted from :(Earne J. & Sherk L., 2013), (Sapundzhieva R., 2011) & (Fanconi P. & Scheurle P., 2017)

Table 3 Public Funders and Private Funders

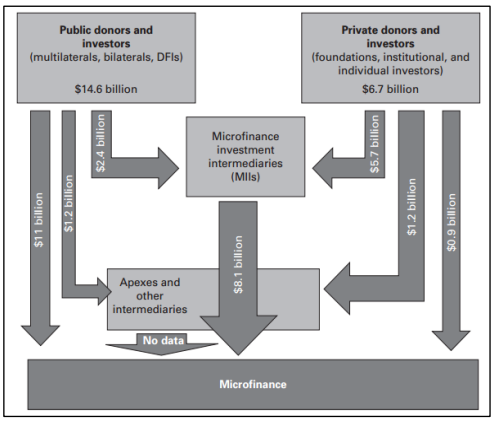
Table 3 gives the detail information of public funders and private funders of MFIs.

Public Funders	Bilateral Agencies	Multilateral Agencies	Development Finance Institutions (DFIs)	
E.g.	Canadian International Development Agency (CIDA), Gesellschaft für Internationale Zusammenarbeit (GTZ), Swedish International Development Cooperation Agency (SIDA), Swiss Development Corporation (SDC), U.K. Department for International Development (DFID), U.S. Agency for International Development (USAID)	African Development Bank (AfDB), Asian Development Bank (ADB), European Commission (EC), International Bank for Reconstruction and Development (IBRD of the World Bank), International Fund for Agricultural Development (IFAD), United Nations Capital Development Fund (UNCDF)	Agencia Española de Cooperación Internacional para el Desarrollo (AECID), Belgian Investment Company for Developing Countries (BIO), Corporación Andina de Fomento (CAF), Dutch Development Agency (FMO), European Bank for Reconstruction and Development (EBRD), European Investment Bank (EIB), Inter-American Investment Corporation (IIC), International Finance Corporation (IFC), KfW Entwicklungsbank (KfW), Multilateral Investment Fund (MIF IADB)	
Tools Used	Grants, guarantees	Grants, guarantees, debt, equity	Debt, equity, guarantees, grants	
Private Funders	**Foundations**	**NGOs**	**Institutional Investors**	**Individuals**
E.g.	Bill & Melinda Gates Foundation, Ford Foundation, Grameen Foundation, Grameen Jameel, MasterCard Foundation, Michael & Susan Dell Foundation	ACCION, ACP, FINCA, Opportunity International, SEPAR	Pension funds, insurance companies, private equity firms, commercial banks	High-net-worth individuals, retail investors, individual donors
Tools Used	Grants, debt, equity	Grants, debt, equity	Debt, equity	Debt, equity, donations, deposits

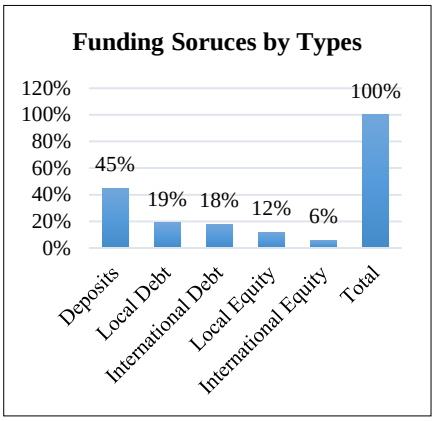
Source: (Earne J. & Sherk L., 2013)

Figure 4 Funding Sources of MFIs

Figure 4 shows the funding sources of MFIs from public funders and private funders and funding sources by types.



Source: (Earne J. & Sherk L., 2013)



Source: (Becker P.M., 2010)

Table 4 Ownership and Funding Sources of MFIs

Table 4 notes the ownership and funding sources of MFIs with different legal status.

Type of MFIs	Ownership	Funding
NGOs	No owners, strong ownership characteristics among founders and board	Grants and debt from development institutions, foundations, socially responsible investors, or aggregators
NBFIs (Non-bank Financial Institutions)	Mix of public and private shareholders; sometimes other financial institutions or other companies	Mix of equity and debt financing from both private and public sources
Rural Banks	Shareholders, government and/or private	Equity and debt financing, usually from public sources and savings
Credit Unions/ Cooperatives	Owned by members	Equity provided from member contributions; deposits and some external debt
MFI Banks	Mostly private shareholders; some development banks as initial shareholders	Mix of equity and debt financing from both private and public sources, deposits

Source: (Ledgerwood J. , Institutional Providers, 2013)

Table 5 Dependent and Independent Variables Summary

Table 5 provides the abbreviations, formulas, and expected results of outcome variables and explanatory variables. Return on equity (ROE) and operational self-sufficient (OSS) proxy for financial performance measurement of MFIs; whereas, the breadth of outreach divided by number of population (LNABP) and the depth of outreach normalized by gross national income per capita (LALBGNI) stand for outreach performance measurement. (Fin. = Financial, Out. = Outreach)

Variable	Abbreviation	Formula	Expected Result	
			Fin.	Out.
Dependent Variable				
Financial Performance Measurement	Return on Equity (ROE)	(Net Operating Income – Taxes)/ (Average Equity)		
	Operational Self-Sufficiency (OSS)	Financial Revenue/ (Financial Expense + Loan-Loss Provision or Impairment Loss+ Operating Expense)		
Outreach Performance Measurement	Breadth of Outreach (LNABP)	Logarithm of Number of Active Borrowers/ Number of Population		
	Depth of Outreach (LALBGNI)	Logarithm of Average Loan Balance per Borrower/Gross National Income Per Capita		
Independent Variable				
Financial Leverage	Debt to Equity (DTE)	Liabilities/Equity		
Loan	GLPTA	Gross Loan Portfolio/ Total Assets	+	+/–
Risk	Portfolio at risk 90 days (PAR90)	Portfolio at Risk > 90 days/Gross Loan Portfolio	–	+/–
Gender Empowerment	Percentage of Female Borrowers (FB)	Number of Active Woman Borrowers/ Number of Active Borrowers	+	+
MFI Size	LSIZE	Logarithm of Total Assets	+	+/–
MFI Age	LAGE	Logarithm of Number of Operating Years	+	+/–
Regulated MFIs	Regulate	Dummy	+/–	+
Profit MFIs	Profit	Dummy	+	+/–
Deposit-taking MFIs	DT	Dummy	+	+

Table 6 Descriptive Statistics Summary

Table 6 is the descriptive statistics summary of dependent variables and independent variables. OSS, ROE, NAB, ALB are dependent variables being representative for operational self-sufficient, return on equity, number of active borrower, and average loan per borrower respectively. DTE, GLPTA, PAR90, FB, LSIZE, AGE are explanatory variables denoted as debt to equity, gross loan portfolio to total asset, non-performing loans (portfolio at risk) past due for more than 90 days, percentage of female borrowers, MFI size, and MFI age respectively.

Variable	Obs	Mean	Std. Dev.	Min	Max
OSS	2,994	1.1691	0.2562	0.3226	2.6923
ROE	2,994	0.1165	0.2831	-3.6744	2.8659
NAB	2,994	116965.6	514771.3	84	6710000
ALB	2,994	1364.064	3074.075	14.98	64087.21
DTE	2,994	4.9543	4.3501	-14.6112	39.1410
GLPTA	2,994	0.7553	0.1741	0.1185	5.7026
PAR90	2,994	0.0395	0.0572	0	0.7602
FB	2,994	0.6593	0.2574	0	1
LSIZE	2,994	7.1969	0.7851	4.8171	9.3075
AGE	2,994	12.1372	7.5190	1	43

Table 7 Correlation Matrix Summary

Table 7 is the correlation matrix summary of dependent variables and independent variables. OSS, ROE, LNABP and LALBGNI are operational self-sufficient, return on equity, the logarithm of number of active borrower/number of population, and the logarithm of average loan per borrower/gross national income per capita respectively. DTE, GLPTA, PAR90, FB, LSIZE and LAGE are debt to equity, gross loan portfolio to total asset, non-performing loans (portfolio at risk) past due for more than 90 days, percentage of female borrowers, MFI size, and MFI age respectively.

	OSS	ROE	LNABP	LALBGNI	DTE	GLPTA	PAR90	FB	LSIZE	LAGE
OSS	1									
ROE	0.53	1								
LNABP	0.09	0.06	1							
LALBGNI	0.03	-0.01	0.21	1						
DTE	-0.11	0.07	0.07	0.12	1					
GLPTA	0.17	0.12	0.03	-0.03	-0.01	1				
PAR90	-0.18	-0.15	0.01	0.04	0.03	-0.07	1			
FB	0.06	0.07	-0.02	-0.56	0.02	0.12	-0.08	1		
LSIZE	0.12	0.11	0.73	0.33	0.22	0.002	0.04	-0.24	1	
LAGE	0.08	0.03	0.42	0.03	0.01	0.05	0.03	0.01	0.48	1

Table 8 Financial Performance Measurement

Table 8 shows the empirical results of the causal relationship between the financial leverage and the financial performance measurement. Dependent variables are return on equity (ROE) and operational self-sufficiency (OSS), respectively. Lagged independent variables are debt to equity (lagDTE), gross loan portfolio to total assets (lagGLPTA), non-performing loans (portfolio at risk) past due for more than 90 days (lagPAR90), percentage of female borrowers (lagFB), MFI size (lagSIZE), MFI age (lagAGE), and three dummy variables: regulated MFIs (Regulate), profit MFIs (Profit), and deposit-taking MFIs (DT). RE is random effects model and FE is fixed effects model.

Regime 1: $ROE_{it} = \alpha_0 + \beta_1 \text{lagDTE}_{it} + \beta_2 \text{lagGLPTA}_{it} + \beta_3 \text{lagPAR90}_{it} + \beta_4 \text{lagFB}_{it} + \beta_5 \text{lagSIZE}_{it} + \beta_6 \text{lagAGE}_{it} + \beta_7 \text{Regulate}_{it} + \beta_8 \text{Profit}_{it} + \beta_9 \text{DT}_{it} + \mu_{it}$

Regime 2: $OSS_{it} = \alpha_0 + \beta_1 \text{lagDTE}_{it} + \beta_2 \text{lagGLPTA}_{it} + \beta_3 \text{lagPAR90}_{it} + \beta_4 \text{lagFB}_{it} + \beta_5 \text{lagSIZE}_{it} + \beta_6 \text{lagAGE}_{it} + \beta_7 \text{Regulate}_{it} + \beta_8 \text{Profit}_{it} + \beta_9 \text{DT}_{it} + \mu_{it}$

	ROE(RE) (1)	ROE(FE) (1)	OSS(RE) (2)	OSS(FE) (2)
lagDTE	0.00927*** (6.39)	0.00976*** (5.55)	-0.000153 (-0.13)	0.00199 (1.50)
lagGLPTA	0.285*** (6.39)	0.287*** (5.23)	0.279*** (7.62)	0.303*** (7.30)
lagPAR90	-0.491*** (-4.69)	-0.297* (-2.34)	-0.431*** (-5.04)	-0.406*** (-4.23)
lagFB	0.0365 (1.03)	0.0742 (1.55)	0.0325 (1.09)	0.0528 (1.46)
lagSIZE	0.0368** (2.66)	0.0428 (1.49)	0.0515*** (4.03)	0.0257 (1.19)
lagAGE	0.0717* (2.41)	0.104* (2.03)	0.115*** (4.31)	0.191*** (4.92)
Regulate	-0.00729 (-0.26)		-0.0315 (-1.13)	
Profit	0.000552 (0.02)		0.0121 (0.51)	
DT	0.0616 (1.56)		-0.0198 (-0.51)	
Constant	-0.649*** (-4.54)	-0.520** (-2.80)	0.456*** (3.32)	0.669*** (4.77)
Observations	2487	2487	2487	2487

t statistics in parentheses, * = p<0.05, ** = p<0.01, *** = p<0.001

Table 9 Outreach Performance Measurement

Table 9 demonstrates the empirical results of the causal relationship between the financial leverage and the outreach performance measurement. Dependent variables are the logarithm of number of active borrowers/number of population (LNABP) and the logarithm of average loan per borrower/gross national income per capita (LALBGNI), respectively. Lagged independent variables are debt to equity (lagDTE), gross loan portfolio to total assets (lagGLPTA), non-performing loans (portfolio at risk) past due for more than 90 days (lagPAR90), percentage of female borrowers (lagFB), MFI size (lagSIZE), MFI age (lagAGE), and three dummy variables: regulated MFIs (Regulate), profit MFIs (Profit), and deposit-taking MFIs (DT). RE is random effects model and FE is fixed effects model.

Regime 3: $LNABP_{it} = \alpha_0 + \beta_1 \text{lagDTE}_{it} + \beta_2 \text{lagGLPTA}_{it} + \beta_3 \text{lagPAR90}_{it} + \beta_4 \text{lagFB}_{it} + \beta_5 \text{lagAGE}_{it} + \beta_6 \text{Regulate}_{it} + \beta_7 \text{Profit}_{it} + \beta_8 \text{DT}_{it} + \mu_{it}$

Regime 4: $LALBGNI_{it} = \alpha_0 + \beta_1 \text{lagDTE}_{it} + \beta_2 \text{lagGLPTA}_{it} + \beta_3 \text{lagPAR90}_{it} + \beta_4 \text{lagFB}_{it} + \beta_5 \text{lagSIZE}_{it} + \beta_6 \text{lagAGE}_{it} + \beta_7 \text{Regulate}_{it} + \beta_8 \text{Profit}_{it} + \beta_9 \text{DT}_{it} + \mu_{it}$

	LNABP(RE) (3)	LNABP(FE) (3)	LALBGNI(RE) (4)	LALBGNI(FE) (4)
lagDTE	0.00536*** (3.93)	0.00450** (3.28)	0.00158 (1.50)	0.00201 (1.86)
lagGLPTA	0.276*** (6.36)	0.273*** (6.23)	-0.0241 (-0.73)	-0.0266 (-0.78)
lagPAR90	-0.281** (-2.80)	-0.274** (-2.71)	-0.139 (-1.81)	-0.211** (-2.70)
lagFB	0.303*** (8.14)	0.281*** (7.38)	-0.227*** (-8.18)	-0.0774** (-2.63)
lagSIZE	.	.	0.168*** (12.34)	0.142*** (8.03)
lagAGE	0.213*** (5.81)	0.118** (2.96)	-0.0788** (-2.93)	-0.0998** (-3.16)
Regulate	0.0706 (0.95)		0.105** (2.89)	
Profit	0.276*** (4.37)		0.0426 (1.37)	
DT	0.195 (1.88)		0.114* (2.24)	
Constant	-4.213*** (-13.90)	-3.920*** (-71.50)	-0.969*** (-5.76)	-1.270*** (-11.10)
Observations	2487	2487	2487	2487

t statistics in parentheses, * p<0.05, ** p<0.01, *** p<0.001

Table 10 Return on Equity (ROE)

Table 10 demonstrates the empirical results of the causal relationship between the financial leverage and the financial performance measurement of MFIs with different legal status using random effects model. Dependent variable is return on equity (ROE). Lagged independent variables are debt to equity (lagDTE), gross loan portfolio to total assets (lagGLPTA), non-performing loans (portfolio at risk) past due for more than 90 days (lagPAR90), percentage of female borrowers (lagFB), MFI size (lagSIZE), MFI age (lagAGE), and three dummy variables: regulated MFIs (Regulate), profit MFIs (Profit), and deposit-taking MFIs (DT). NGO is non-government organization, NBFI is non-bank financial institution, CU/COO is credit union/cooperative, and RB is rural bank.

Regime 1: $ROE_{it} = \alpha_0 + \beta_1 \text{lagDTE}_{it} + \beta_2 \text{lagGLPTA}_{it} + \beta_3 \text{lagPAR90}_{it} + \beta_4 \text{lagFB}_{it} + \beta_5 \text{lagSIZE}_{it} + \beta_6 \text{lagAGE}_{it} + \beta_7 \text{Regulate}_{it} + \beta_8 \text{Profit}_{it} + \beta_9 \text{DT}_{it} + \mu_{it}$

	NGO (1)	NBFI (1)	Bank (1)	CU/COO (1)	RB (1)
lagDTE	0.00990** (3.05)	0.0200*** (6.53)	0.00129 (0.42)	0.0062 (1.95)	-0.0019 (-0.66)
lagGLPTA	0.481*** (4.52)	0.207** (2.59)	0.135 (1.53)	0.137 (1.17)	0.0161 (0.13)
lagPAR90	-0.864** (-3.29)	-0.409* (-2.50)	-0.119 (-0.54)	-0.476* (-1.97)	-0.771** (-2.81)
lagFB	0.0411 (0.47)	0.0407 (0.71)	0.117 (1.05)	-0.018 (-0.22)	0.0768 (0.76)
lagSIZE	0.0429 (1.13)	0.022 (1.02)	0.0258 (0.63)	0.0508 (1.73)	0.0541 (0.94)
lagAGE	0.0113 (0.15)	0.0727 (1.4)	0.206** (2.68)	0.0776 (1.21)	-0.0685 (-0.93)
Regulate	-0.0126 (-0.19)	-0.0651 (-1.35)		0.00572 (0.08)	
Profit	-0.0917 (-0.73)	-0.0356 (-0.92)	0.0112 (0.08)	0.339** (2.88)	0.243* (2.53)
DT	0.0378 (0.4)	0.0707 (1.27)		0.0136 (0.07)	
Constant	-1.113*** (-3.33)	-0.086 (-0.49)	-0.248 (-0.70)	-0.243 (-0.92)	-0.169 (-0.46)
Observations	698	698	412	524	137

t statistics in parentheses, * p<0.05, ** p<0.01, *** p<0.001

Table 11 Operational Self-Sufficiency (OSS)

Table 11 presents the empirical results of the causal relationship between the financial leverage and the financial performance measurement of MFIs with different legal status using random effects model. Dependent variable is operational self-sufficiency (OSS). Lagged independent variables are debt to equity (lagDTE), gross loan portfolio to total assets (lagGLPTA), non-performing loans (portfolio at risk) past due for more than 90 days (lagPAR90), percentage of female borrowers (lagFB), MFI size (lagSIZE), MFI age (lagAGE), and three dummy variables: regulated MFIs (Regulate), profit MFIs (Profit), and deposit-taking MFIs (DT). NGO is non-government organization, NBFI is non-bank financial institution, CU/COO is credit union/cooperative, and RB is rural bank.

Regime 2: $OSS_{it} = \alpha_0 + \beta_1 \text{lagDTE}_{it} + \beta_2 \text{lagGLPTA}_{it} + \beta_3 \text{lagPAR90}_{it} + \beta_4 \text{lagFB}_{it} + \beta_5 \text{lagSIZE}_{it} + \beta_6 \text{lagAGE}_{it} + \beta_7 \text{Regulate}_{it} + \beta_8 \text{Profit}_{it} + \beta_9 \text{DT}_{it} + \mu_{it}$

	NGO (2)	NBFI (2)	Bank (2)	CU/COO (2)	RB (2)
lagDTE	-0.000124	-0.00118	-0.00712**	0.000627	-0.00208
	(-0.05)	(-0.37)	(-2.69)	(0.28)	(-0.72)
lagGLPTA	0.293***	0.366***	0.0934	0.0672	-0.0254
	(3.85)	(4.77)	(1.33)	(0.81)	(-0.22)
lagPAR90	-0.738***	-0.300	-0.269	-0.454**	-0.467
	(-3.93)	(-1.72)	(-1.43)	(-2.69)	(-1.88)
lagFB	-0.00912	0.0414	0.238**	0.067	0.0509
	(-0.15)	(0.67)	(2.67)	(1.11)	(0.57)
lagSIZE	0.0636*	0.0524	0.116***	0.0494*	0.106
	(2.23)	(1.95)	(4.00)	(2.21)	(1.85)
lagAGE	0.036	0.170**	0.227***	0.0643	0.0601
	(0.65)	(2.68)	(4.13)	(1.35)	(0.81)
Regulate	-0.0617	-0.0858		0.00471	
	(-1.20)	(-1.13)		(0.09)	
Profit	-0.0284	-0.0116	-0.0621	0.022	0.0492
	(-0.29)	(-0.18)	(-0.73)	(0.24)	(0.49)
DT	0.0215	-0.0221		0.147	
	(0.30)	(-0.26)		(1.01)	
Constant	0.213	0.576*	0.288	1.124***	0.571
	(0.84)	(2.51)	(1.24)	(5.87)	(1.61)
Observations	698	698	412	524	137

t statistics in parentheses, * p<0.05, ** p<0.01, *** p<0.001

Table 12 Breadth of Outreach (LNABP)

Table 12 shows the empirical results of the causal relationship between the financial leverage and the outreach performance measurement of MFIs with different legal status using random effects model. Dependent variable is the logarithm of number of active borrowers/number of population (LNABP). Lagged independent variables are debt to equity (lagDTE), gross loan portfolio to total assets (lagGLPTA), non-performing loans (portfolio at risk) past due for more than 90 days (lagPAR90), percentage of female borrowers (lagFB), MFI age (lagAGE), and three dummy variables: regulated MFIs (Regulate), profit MFIs (Profit), and deposit-taking MFIs (DT). NGO is non-government organization, NBFI is non-bank financial institution, CU/COO is credit union/cooperative, and RB is rural bank.

Regime 3: $LNABP_{it} = \alpha_0 + \beta_1 \text{lagDTE}_{it} + \beta_2 \text{lagGLPTA}_{it} + \beta_3 \text{lagPAR90}_{it} + \beta_4 \text{lagFB}_{it} + \beta_5 \text{lagAGE}_{it} + \beta_6 \text{Regulate}_{it} + \beta_7 \text{Profit}_{it} + \beta_8 \text{DT}_{it} + \mu_{it}$

	NGO (3)	NBFI (3)	Bank (3)	CU/COO (3)	RB (3)
lagDTE	0.00537*	0.00731*	0.00783*	0.00253	-0.00389
	(2.29)	(1.98)	(2.34)	(1.06)	(-0.72)
lagGLPTA	0.0922	0.545***	0.401***	0.0956	0.524*
	(1.17)	(6.33)	(3.90)	(1.04)	(2.54)
lagPAR90	-0.179	-0.232	-0.977***	-0.439*	-0.173
	(-0.93)	(-1.12)	(-3.95)	(-2.36)	(-0.40)
lagFB	0.164*	0.403***	0.651***	0.00885	0.669***
	(2.56)	(5.48)	(5.02)	(0.12)	(4.44)
lagAGE	0.217**	0.227**	0.118	0.182**	-0.318*
	(3.21)	(2.69)	(1.18)	(2.76)	(-2.07)
Regulate	0.0196	0.188		0.154	
	(0.16)	(0.99)		(0.85)	
Profit	0.0369	0.0339	0.298	0.0402	0.725**
	(0.16)	(0.21)	(0.78)	(0.14)	(3.14)
DT	-0.0712	0.124		-0.118	
	(-0.41)	(0.59)		(-0.23)	
Constant	-4.448***	-4.690***	-3.792***	-4.285***	-4.573***
	(-9.24)	(-11.11)	(-6.53)	(-9.31)	(-13.23)
Observations	698	698	412	524	137

t statistics in parentheses, * p<0.05, ** p<0.01, *** p<0.001

Table 13 Depth of Outreach (LALBGNI)

Table 13 illustrates the empirical results of the causal relationship between the financial leverage and the outreach performance measurement of MFIs with different legal status using random effects model. Dependent variable is the logarithm of average loan per borrower/gross national income per capita (LALBGNI). Lagged independent variables are debt to equity (lagDTE), gross loan portfolio to total assets (lagGLPTA), non-performing loans (portfolio at risk) past due for more than 90 days (lagPAR90), percentage of female borrowers (lagFB), MFI size (lagSIZE), MFI age (lagAGE), and three dummy variables: regulated MFIs (Regulate), profit MFIs (Profit), and deposit-taking MFIs (DT). NGO is non-government organization, NBFI is non-bank financial institution, CU/COO is credit union/cooperative, and RB is rural bank.

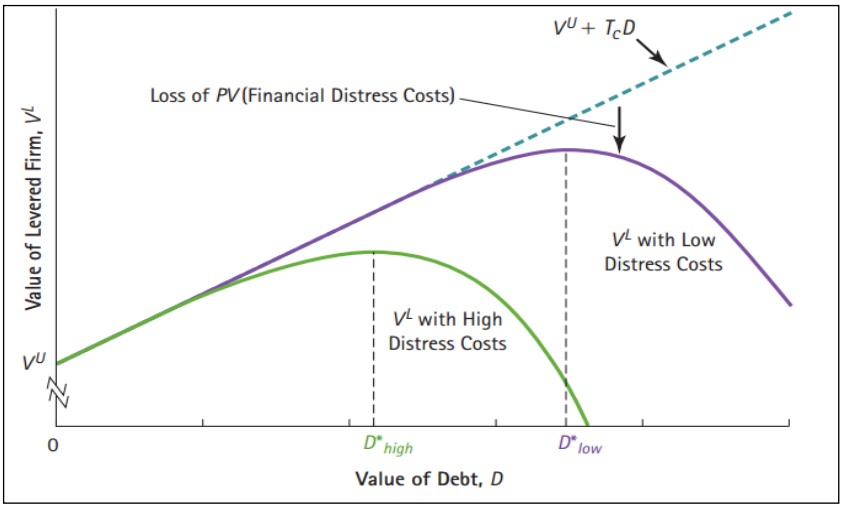
Regime 4: $LALBGNI_{it} = \alpha_0 + \beta_1 \text{lagDTE}_{it} + \beta_2 \text{lagGLPTA}_{it} + \beta_3 \text{lagPAR90}_{it} + \beta_4 \text{lagFB}_{it} + \beta_5 \text{lagSIZE}_{it} + \beta_6 \text{lagAGE}_{it} + \beta_7 \text{Regulate}_{it} + \beta_8 \text{Profit}_{it} + \beta_9 \text{DT}_{it} + \mu_{it}$

	NGO (4)	NBFI (4)	Bank (4)	CU/COO (4)	RB (4)
lagDTE	0.000714 (0.44)	0.00346 (1.34)	-0.00196 (-0.65)	0.00292 (1.31)	0.0116** (3.08)
lagGLPTA	0.0562 (1.05)	-0.019 (-0.31)	-0.209* (-2.38)	0.0793 (0.94)	-0.0945 (-0.68)
lagPAR90	-0.424** (-3.23)	-0.240 (-1.70)	0.361 (1.66)	0.0774 (0.45)	-0.0852 (-0.30)
lagFB	-0.175*** (-4.02)	-0.169*** (-3.38)	-0.369*** (-3.32)	-0.155* (-2.34)	-0.207* (-2.06)
lagSIZE	0.107*** (4.38)	0.131*** (5.65)	0.189*** (4.29)	0.224*** (7.36)	0.0324 (0.41)
lagAGE	-0.0182 (-0.41)	-0.204*** (-3.72)	-0.0824 (-1.01)	-0.0714 (-1.24)	0.357** (3.20)
Regulate	-0.0145 (-0.28)	0.113 (1.42)		0.0961 (1.12)	
Profit	-0.0948 (-0.97)	-0.0599 (-0.90)	0.128 (0.63)	-0.444** (-3.16)	-0.121 (-0.54)
DT	0.00456 (0.06)	0.0226 (0.25)		-0.251 (-1.06)	
Constant	-0.632** (-2.64)	-1.366*** (-6.24)	-1.005* (-2.35)	-1.653*** (-5.93)	-0.891 (-1.67)
Observations	698	698	412	524	137

t statistics in parentheses, * p<0.05, ** p<0.01, *** p<0.001

Table 14 Optimal Leverage of Firm

Table 14 demonstrates the optimal leverage level of firm based on the trade-off theory. The marginal cost of leverage would be increased over the marginal benefit at the certain point.



Source: (Berk J., DeMarzo P. & Harford J., 2012)

국 문 초 록

자본 구조와 미소금융 기관의 성과

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경영학과 재무금융 전공
Ly Sophy

자본 구조와 성과의 기존 연구들은 자본 구조 이론을 바탕으로 이익추구형 기업이나 금융기관을 포함한 다양한 기업들이 어떻게 자본 조달 결정을 할 것인가에 대해 다뤘다. 그러나, 미소금융 기관을 주제로 한 자본 구조 연구는 상당히 제한적인데 그 이유는 미소금융이 특정 지역이나 국가에서 이뤄지고 이전 연구에서 미소금융기관의 독특한 특성을 포함하지 못했기 때문이다. 미소금융기관은 개발도상국의 빈곤 완화가 주 목적이기 때문에 다른 전통적인 금융기관들과는 달리 자급력과 원조활동이 주요 관심사이다. 본 논문은 몇 가지 목적에 따라 진행되었다.

우선, 본 논문은 독자들에게 미소금융기관에 대해 짧게 개략적 설명을 하고자 한다. 다음, 2003년부터 2015년 까지 44개국에 있는 507개의 미소금융 기관의 성과와 lagged 부채자본비율(lagDTE)로 나타낸 자본 구조와의 인과관계를 밝히고자 한다. 다른 금융 기관들과 다르게, 미소 금융 기관의 성과는 재무적 성과나 원조활동 성과로 측정되는데 본 연구에서는 재무성과의 지표로써 자기자본 이익률(ROE)과 운영 자급률(OSS)을 살펴보고, 원조활동 성과의 지표로써 원조 활동의 폭을 인구수로 나눈 로그값 (LNABP)과 원조 활동의 심도를 1인당 국민 총소득으로 나눈 로그값(LALBGNI)를 사용한다. 주요 설명 변수는 lagDTE이고, 다른 lagged 통제 변수로는 총자산대비 총대출자산 (lagGLPTA), 90일 만기가 지난 부실여신 (lagPAR90), 여성 고객 비율 (lagFB), 미소금융기관 규모 (lagSIZE), 미소금융기관 나이 (lagAGE), 그리고 세 개의 더미 변수, 이익추구형 미소금융기관 (Profit), 미소금융기관 규제 (Regulate), 그리고 예금상품을 취급하는 미소금융기관 (DT), 가 있다.

랜덤 효과와 고정 효과 패널 자료 모형을 통해 실증적으로 분석한 결과 기존 문헌들의 결과와 일관되게 차입에 의한 절세 효과로 재무 레버리지가 수익성(ROE)과 원조활동의 폭 (LNABP)에 유의미하게 긍정적인 영향을 미친다는 것을 확인 할 수 있었고, 이것은 미소금융기관도 기업 재무의 trade-off theory를 따른 다는 것을 보여준다. 반대로, lagged 부채자본비율 (lagDTE)은 운영 자급률 (OSS)와 원조 활동의 심도 (LALBGNI)에 유의하게 영향을 미치지 않는 것으로 나왔다. 재무 레버리지와 운영 자급률 (OSS)의 유의하지 않은 관계는 운영 비용을 보상하는 데 필요한 충분한 수익을 내지 못하는 많은 미소금융기관 때문일 수도 있다. 더 나아가, 다른 법적 지위와 관련하여 미소금융기관의 성과에 대한 재무 레버리지의 효과는 대부분 유의하지 않았다. 그 주요한 이유로 대다수의 주주들이 공공 기금인 것을 감안할 때 미소금융기관이 동일한 조직 모형과 목적을 설정하고 있기 때문일 것이다. 또한, 미소금융기관은 미소금융 투자 기구를 통해 공적, 민간 자본으로부터 투자 지원을 안정적으로 받을 수 있을지도 모른다.

마지막 제안으로는, 각 관련된 분야에서 그러므로 세부 전략, 법, 그리고 규제를 세우기 전에 Trade-off theory에 따라 비용 대비 부채의 사용이 추가적인 이익을 낼 수도 있고 혹은 재무적 불안정성을 야기할 수도 있으므로 재무적 의사결정을 고려해야 한다. 추가로, 비용 절감과 지속 가능 개발을 할 수 있도록 대체 자금 원천인 예금을 확충하고 혁신적인 기술의 발전시켜야 한다.

주요어: 자본 구조, 재무 레버리지, 운영 자급률 (OSS), 자기자본 이익률 (ROE), 원조활동의 폭 (NAB), 원조활동의 심도 (ALB)

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